



Emotional Reactivity and Dysregulation and Problematic Internet Use on Twitter [†]

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[†] Presented at the 2024 IEEE 4th International Conference on Electronic Communications, Internet of Things and Big Data, Taipei, Taiwan, 19–21 April 2024.

Abstract: Social media users can experience Problematic Internet Use (PIU) in the form of psychological problems, such as loneliness, social anxiety, and depression. They tend to have antecedents in the form of emotional dysregulation and reactivity, making them easily respond to stimuli on social media that cause stress. This study aims to prove that emotional dysregulation and reactivity are precursors of PIU for social media users. With 307 Twitter users as the participants of this study, three proposed hypotheses were tested, and the results showed that emotional dysregulation causes PIU, with emotional reactivity as a mediator.

Keywords: emotion; emotional dysregulation; emotional reactivity; problematic internet use; Twitter; social media

1. Introduction

The development of digital technology has increased the penetration rate of Internet usage in Indonesia by 1.17% compared to 2022 [1]. The COVID-19 pandemic had a positive impact, increasing Indonesian internet literacy in terms of productive and entertainment purposes. The data released by Asosiasi Penyelenggara Jasa Internet Indonesia (APJII, Indonesia Internet Service Provider Association) in 2023 showed that accessing social media was the main activity carried out by Internet users in Indonesia: 98.02% [1]. These data were also in line with the facts found in Ref. [2], showing that Indonesia is the fifth most Twitter-using country in the world.

The use of social media during the pandemic helped strengthen the mental health of users by making them pay attention to emotional regulation; however, on the other hand, social media dependence was associated with depression [3]. Problematic Internet Use (PIU) means an excessive use of social media that interferes with a person's mental health and can even result in negative behaviors, such as drug abuse, gambling [4], cyberbullying [5], and suicidal ideation and self-injury [6], during a student's academic life [7]. There are emotional reactions to Twitter posts that involve mutual aggression or hate speech [8], which has been researched in the context of Indonesia [9]. Emotional reactions to social media can indicate PIU [10] as users cannot manage their emotions [11–13].

This study aims to find empirical evidence on the role of emotional reactivity and dysregulation in predicting PIU among Twitter social media users. Twitter is a social media platform that has generated the most hate speech in Indonesia, from the Jakarta Governor Election in 2017 [14] to the Indonesian Presidential Election in 2019 [15]. Social discomfort was felt during this period due to fears of disintegration in Indonesia. The stimuli of such events were perceived by individuals or society as negative and resulted in emotional



Citation: Andangsari, E.; Putri, T.; Ghaisani, S.; Ali, M.; Paramita, G.; Kemala, A. Emotional Reactivity and Dysregulation and Problematic Internet Use on Twitter. *Eng. Proc.* **2024**, *74*, 7. <https://doi.org/10.3390/engproc2024074007>

Academic Editors: Shu-Han Liao, Teen-Hang Meen and Cheng-Fu Yang

Published: 27 August 2024



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reactivity [16]. Emotional reactivity does not require an individual to have any emotional experience or reaction. An event that an individual has just experienced or observed can provoke an emotional reaction [16,17].

We observed that Twitter users wrote negative responses in their posts, showing their emotional reactivity on social media. The dimensions of emotional reactivity include sensitivity or reactivity, intensity, and persistence or perseverance [17,18], emphasizing the existence of emotional reactivity as an issue in social media activities. Twitter users who comment on a tweet present emotional sensitivity as they are vulnerable to being emotionally provoked by even simple stimuli. Furthermore, strong emotional reactions, such as outbursts of anger, presented in hateful words or negative sentences, are a sign of emotional intensity. Someone holding strong emotions and needing time to calm down indicates emotional persistence or perseverance. The consistency of emotional responses on Twitter from the 2017 Daerah Khusus Ibukota Jakarta governor election and the 2019 presidential election showed symptoms of emotional persistence among Twitter users in Indonesia. This raised the question of whether emotional reactivity, unidimensional and multidimensional, could predict PIU in Twitter users in Indonesia. Thus, we proposed the following hypotheses in this study (Figure 1).

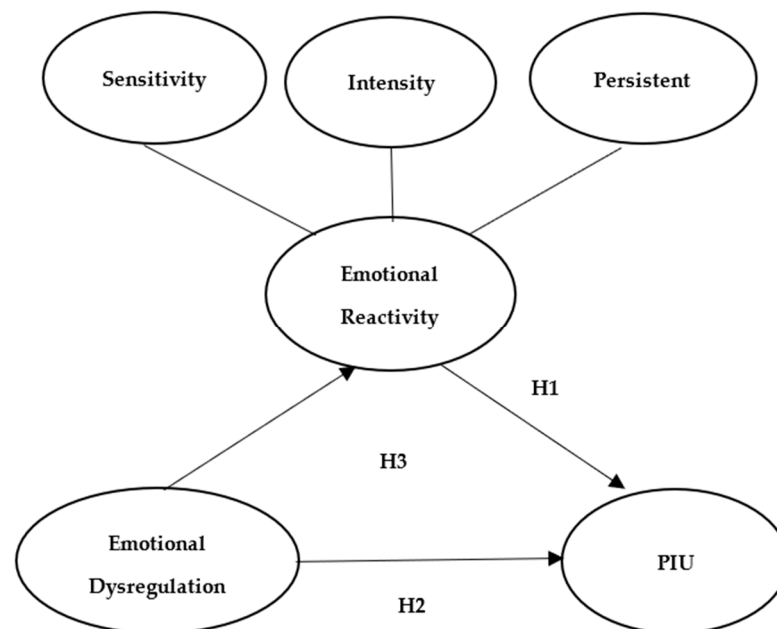


Figure 1. Relationships between variables and proposed hypotheses.

- H1: Individuals with high emotional reactivity (unidimensional) have significant PIU.

The inability to manage emotions is related to negative social media use behavior and results in PIU [10–12]; thus, this allows for the second hypothesis.

- H2: Individuals with high emotional dysregulation have PIU.

According to Herres et al. [19], people with high emotional reactivity have high emotional dysregulation. Emotional reactivity and dysregulation may lead to PIU. Emotional reactivity is a behavioral manifestation of emotional dysregulation in one's cognition. Therefore, emotional dysregulation impacts PIU through the mediation of emotional reactivity. Therefore, the third hypothesis was suggested for the relationship among the three variables.

- H3: Emotional dysregulation can significantly predict the onset of PIU through the mediation of emotional reactivity.

1.1. PIU

PIU is a problematic cognitive and behavioral maladaptive syndrome involving Internet use that negatively affects professional, social, and academic well-being [20,21]. It is assumed that PIU causes psychological problems, such as depression, loneliness, and anxiety. However, a meta-analysis showed that PIU is a consequence of psychological problems experienced by an individual [22,23]. This means that someone who experiences depression, loneliness, or anxiety has maladaptive cognition. Thus, the behavior of using the Internet becomes maladaptive. Thus, it is essential to understand that PIU is one of the mental disorders that someone in this digital era can experience [4,11]. PIU is considered a spectrum: individuals can be positioned on a spectrum ranging from very low PIU to very high PIU [24]. We used the PIU scale constructed by Caplan, which consisted of five dimensions in this study.

- Preference for Online Social Interaction (POSI): the tendency to interact with other people via the Internet because they feel safer and more comfortable.
- Mood regulation: the diversion of feelings or troubled moods by using the Internet as a means of escape.
- Cognitive preoccupation: obsessive thoughts about using the Internet even when offline.
- Compulsive Internet use: a condition where a person can no longer control their Internet use behavior. There is a tendency to use the Internet excessively without any clear purpose.
- Negative outcome: the impact experienced by individuals both personally and professionally as a result of Problematic Internet Use [21].

1.2. Emotional Reactivity

Emotional reactivity is an elicitation of a response relating to an external event or situation experienced by a person [16]. Individuals do not need previous experience for emotional reactivity to be triggered because emotional responses can emerge from just one specific stimulus. Emotional reactivity includes the sensitivity, intensity, and persistence of an emotion experienced by a person [19]. An individual with high emotional reactivity is likely to react to emotional stimuli or stressful situations [25]; thus, these individuals are associated with many mental health problems, from self-injury behavior and suicidal ideation to suicide attempts. Adolescents with high emotional reactivity are prone to interpersonal conflicts with friends or romantic relationships [26]. Emotional reactivity, in principle, is a conceptualized component in emotional regulation [27]. Emotional reactivity refers to direct emotional experiences relating to “good” and “bad” stimuli. Meanwhile, emotional regulation/dysregulation is an emotional process that is internally managed and is a contributing factor in certain mental disorders.

1.3. Emotional Dysregulation

Similar to emotional reactivity, emotional dysregulation is a potential factor in experiencing mental health disorders [13]. The concept of emotional dysregulation is a combination of traits such as sensitivity, intensity, and the deceleration of emotions back to baseline [28]. The conceptualization chosen in this study was based on previous research [29,30], which indicated that personality characteristics contribute to the appearance of individual posts on Twitter, including posts that can provoke emotional reactions in others. Emotional regulation/emotional dysregulation and emotional reactivity are two interrelated matters when discussing mental problems [31]. Psychological issues occur due to poor emotional dysregulation and reactivity. People with high emotional reactivity have high emotional dysregulation [18]; in other words, emotional dysregulation impacts a person’s emotional reactivity. Individuals with anxiety have negative and poorly managed emotional patterns, causing poor emotional reactivity. This affects a person’s psychological condition. Thus, in this study, we assumed that emotional dysregulation impacts PIU as a mental health disorder in the digital era.

2. Method

In total, 524 users were invited to this study. After elimination relating to the active use of Twitter for the last 3 months and accessible accounts, 307 participants remained. The participants were aged from 17 to 50 years old ($M = 21.47$; $SD = 3.41$), and 75.24% of them were females. The demographic data of the participants are shown in Table 1. Most participants lived outside Greater Jakarta (43.97%), which indicated that the participants were from many cities in Indonesia. Students accounted for 77.52% of the sample, which is in line with the data from APJII [1]. In total, 72.96% were active Twitter users, and 95.76% did not have jobs related to Twitter. The data showed a strong possibility of being exposed to hate speech and hoaxes.

Table 1. Demography of participants in this study (N = 307).

	Item	Number	Ratio (%)
Residence location	Jakarta	88	28.66
	Bogor	12	3.91
	Depok	14	4.56
	Tangerang	44	14.33
	Bekasi	14	4.56
	Outside Greater Jakarta	135	43.97
Occupation	Student	238	77.52
	Private Employee	44	14.33
	Government Employee	4	1.30
	Entrepreneur	6	1.95
	Freelancer	2	0.65
	Housewife	3	0.98
	Others	10	3.26
Years of using Twitter	Less than 1 year	35	11.40
	1–3 years	48	15.64
	More than 3 years	224	72.96
Work on Twitter	Yes	13	4.24
	No	294	95.76

2.1. Procedure and Materials

All of the participants provided informed consent for ethical clearance purposes and stated their willingness to participate in this study. They were given instructions to fill out the three questionnaires and demographic data. PIU was measured using the Generalized Problematic Internet Use Scale 2 (GPIUS2) constructed by Caplan [21] and adapted to Bahasa Indonesia [32]. It consisted of 5 dimensions (POSI, mood regulation, cognitive preoccupation, compulsive Internet use, and negative outcome), and 15 items on a 7-point scale (1 = strongly disagree to 7 = strongly agree) were included in the dimensions. The internal consistency of GPIUS2 in the Bahasa Indonesia version in this study was $\alpha = 0.897$. Emotional reactivity was measured using the emotional reactivity scale (ERS) constructed by Nock et al. [17] and adapted to Bahasa Indonesia [9]. The ERS consisted of 21 items in 3 dimensions (emotional sensitivity, emotional intensity, and emotional persistence) on a 7-point scale from 1 = strongly disagree to 7 = strongly agree. The internal consistency of the ERS Bahasa Indonesia version in this study was $\alpha = 0.930$, and internal consistency for its dimensions ranged from $\alpha = 0.753$ to $\alpha = 0.891$. Emotional dysregulation was measured using the General Emotion Dysregulation Measure (GEDM) constructed by Linehan [33], modified by Newhill et al. [34], and adapted to Bahasa Indonesia. The GEDM consisted of 13 items in 3 dimensions (emotional sensitivity, emotional response, and slow return to baseline) on a 5-point scale from 1 = very weak to 5 = very strong. The internal consistency of GEDM in the Bahasa Indonesia version was $\alpha = 0.917$.

2.2. Data Analysis

The data were analyzed using linear regression statistics for H1 and H2 and mediation analysis for H3. The data were analyzed using JASP 0.17.1.0 version. Demographic data were presented with descriptive statistics.

3. Results and Discussion

The descriptive score is shown in Table 2. We calculated PIU as a single score, emotional reactivity in unidimensional and multidimensional scores, and emotional dysregulation as a unidimensional score.

Table 2. Scores of each dimension.

Dimension	Mean	Standard Deviation (SD)	Minimum	Maximum
PIU	67.10	18.90	22.00	113.00
Emotional reactivity	66.82	16.77	26.00	105.00
Emotional reactivity—sensitivity	31.37	9.10	10.00	50.00
Emotional reactivity—intensity	23.13	5.65	8.00	35.00
Emotional reactivity—persistence	12.32	3.74	4.00	20.00
Emotional dysregulation	40.01	11.05	14.00	65.000

Based on the regression analysis results (Table 3), hypothesis H1 was supported ($R^2 = 0.21$, $F(77.014, 1)$), indicating that emotional reactivity played a significant role in predicting PIU. Emotional reactivity had an effect of 46% on PIU. The participants with a high score on emotional reactivity had a strong spectrum of PIU ($R^2 = 0.22$, $F(28.958, 3)$). Emotional persistence had an effect of 25.1% on PIU. Twitter users had a slow response to return to their emotional baseline after reacting to the emotional stimuli on Twitter. H2 was also supported ($R^2 = 0.16$, $F(56.49, 1)$), and emotional dysregulation had a 40% effect on PIU. The results showed a strong effect of emotional dysregulation on PIU, meaning that Twitter users with high emotional dysregulation were higher on the spectrum for PIU.

Table 3. Results of regression analysis.

	Sum of Square	Degree of Freedom	F	Significance
PIU on emotional reactivity (ER)	21,431.12	1	77.014	$p < 0.001$
PIU on sensitivity, intensity, persistence	24,358.39	3	28.958	$p < 0.001$
PIU on emotional dysregulation (ED)	17,081.73	1	56.49	$p < 0.001$
	R	R ²	Adjusted R ²	root mean square error
PIU on emotional reactivity (ER)	0.46	0.21	0.21	16.84
PIU on sensitivity, intensity, persistence	0.47	0.22	0.22	16.75
PIU on emotional dysregulation (ED)	0.40	0.16	0.15	17.39
	Standardized (β)	t-value	Significance	
PIU on emotional reactivity (ER)	0.457	8.982	$p < 0.001$	
PIU on sensitivity	0.223	2.470	$p > 0.001$	
PIU on intensity	0.055	0.614	$p > 0.001$	
PIU on persistence	0.251	3.742	$p < 0.001$	
PIU on emotional dysregulation (ED)	0.395	7.516	$p < 0.001$	

H3 was supported in this study. Thus, emotional reactivity was a significant mediator in predicting PIU on emotional dysregulation. The result of the H3 test is shown in Table 4 and Figure 2. PIU had no significant effect on emotional dysregulation, which is in line with previous research [13].

Table 4. Mediation effect of emotional reactivity, supporting H3.

Measurement	Estimate	Standard Error	z-Value	Significance
Direct effect: PIU on emotional dysregulation	<−0.001	0.01	−0.10	$p > 0.001$
Indirect effect: emotional dysregulation → emotional reactivity → PIU	0.04	0.01	4.49	$p < 0.001$
Total effect: PIU on emotional dysregulation	0.04	0.004	7.54	$p < 0.001$
Path Coefficient	Estimate	Standard Error	z-Value	Significance
PIU on emotional reactivity	0.47	0.10	4.53	$p < 0.001$
PIU on emotional dysregulation	<−0.001	0.01	−0.10	$p > 0.001$
Emotional reactivity on emotional dysregulation	0.08	0.003	30.89	$p < 0.001$

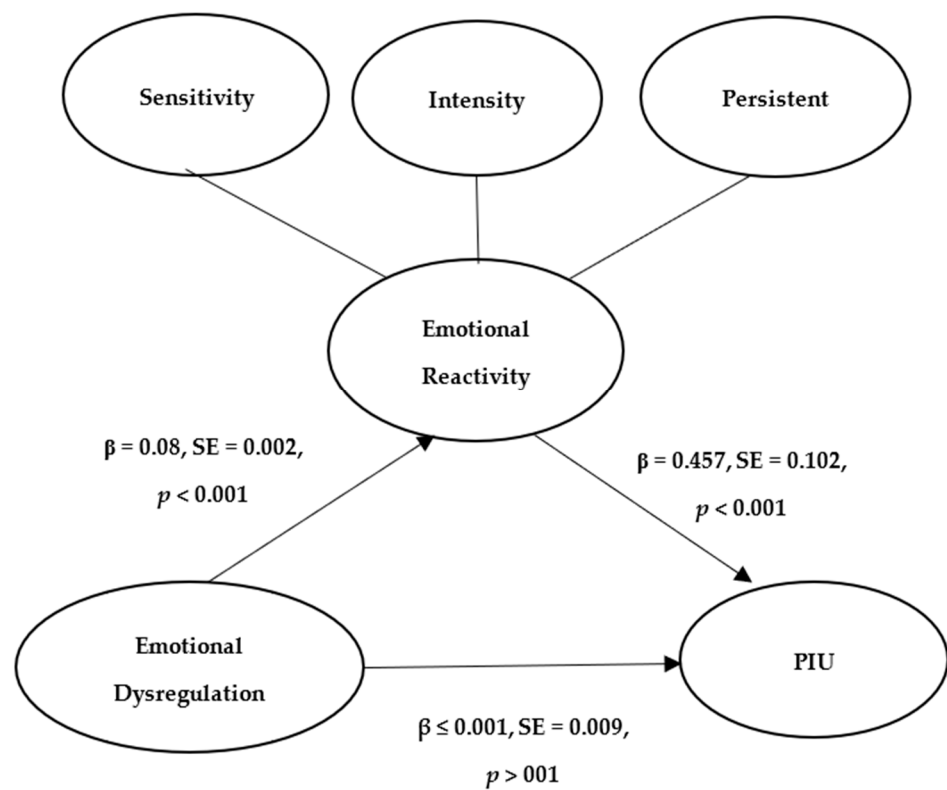


Figure 2. Mediation effect of emotional reactivity.

The path coefficients indicated that emotional reactivity played an important role in predicting PIU. Emotional dysregulation was a precursor of emotional reactivity. When it is difficult for Twitter users to manage their emotions, it is easy for them to respond emotionally to the stimuli they receive [19,25]. The findings from the path coefficient showed the role of emotional reactivity in predicting PIU [10]. Emotional dysregulation alone did not play a significant role in predicting PIU owing to the unique behavior of Twitter users. Instead, emotional dysregulation affects sensitivity, intensity, and slow response [28]. Twitter users seem to be easily provoked emotionally when interacting with social media. They can manage their emotions but easily react emotionally or have strong emotional reactivity. The results of PIU regression on the dimensions of emotional reactivity (Table 4) revealed that the participants were slow in returning to their baseline when experiencing negative emotions. They were provoked emotionally, not because of their sensitivity to stimuli, but because of difficulty returning to their emotional baseline or because of strong emotional persistence. Thus, emotional dysregulation is associated

with PIU through emotional reactivity as a mediator. Emotional reactivity manifests the difficulty for Twitter users to return to the baseline of their emotional reactions.

4. Conclusions

Emotional reactivity is a mediator of the relationship between PIU and emotional dysregulation. For Twitter users, emotional dysregulation can be used to predict PIU through emotional reactivity. Such results show the importance of being selective about posts on Twitter. Social media, as a product of digital technology, provides benefits but may cause mental problems due to carelessness. Social media users need to recognize their emotional responses. The more they realize their weakness in managing their emotions, the easier it is for them to control their emotional responses, and the better they can select posts on social media. Sometimes, it is recommended to pause social media activities. Social media users can be active on social media when emotional conditions return to their baseline. In this study, we surveyed normal users. Subsequent research is needed to examine users with mental problems to develop an early warning system for emotional reactivity on social media that can alert users relating to their mental status.

Author Contributions: Conceptualization, E.A. and M.A.; methodology, E.A., T.P., S.G., M.A., G.P. and A.K.; validation, E.A., T.P., S.G. and M.A.; formal analysis, E.A., T.P., S.G. and M.A.; investigation, T.P., S.G., M.A., G.P. and A.K.; resources, E.A., T.P., S.G., M.A., G.P. and A.K.; data curation, E.A., T.P., S.G., M.A., G.P. and A.K.; writing—original draft preparation, E.A., T.P., S.G. and M.A.; writing—review and editing, E.A.; visualization, E.A.; supervision, E.A.; funding acquisition, M.A. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by an International Research Grant from BINA NUSANTARA UNIVERSITY No: 029/VRRTT/III/2023. The APC was funded by the authors themselves.

Institutional Review Board Statement: The authors have been registered ethical consideration to the Bina Nusantara University ethical committee for the publication ethic. However, the committee still sent for ethical approval. For this reason, the authors passed the preregistration to the Open Science Framework (OSF) via link <https://osf.io/k3rup>.

Informed Consent Statement: Informed consent was obtained from all subjects involved in this study.

Data Availability Statement: Data in this study was registered on Mendeley Data as Andangsari, Esther Widhi; Putri, Trisa; Ghaisani, Shavina; Ali, Moondore Madalina; Paramitha, Greta Vidya; Kemala, Ade Putera (2024), "Problematic Internet Use (PIU), Emotional Dysregulation, and Emotional Reactivity of Twitter Users" see Problematic Internet Use (PIU), Emotional Dysregulation, and Emotional Reactivity of Twitter Users—Mendeley Data.

Conflicts of Interest: The authors declare no conflicts of interest. The funders had no role in the design of the study, in the collection, analyses, or interpretation of data, in the writing of the manuscript, or in the decision to publish the results.

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