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RESEARCH ARTICLE



The relationship between schema modes and problematic pornography use in youth: the mediating role of emotional dysregulation

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ABSTRACT

The global increase in pornography use is largely due to greater access to the Internet. Research suggests that early maladaptive schemas (EMSs) play a significant role in problematic pornography use (PPU), suggesting a potential link between PPU and schema modes. Schema modes are also associated with significant emotional dysregulation, and individuals often turn to pornography to manage their negative emotions. This study used structural equation modelling (SEM) and the software Amos to examine the indirect effect between schema modes and PPU, and considered emotional dysregulation as a mediating factor. Data were collected from 392 participants (77.6% male, $M_{age} = 20.90$) via an online questionnaire, and confirmatory factor analysis (CFA) indicated good fit of the measurement instruments including questionnaires of PPU, Schema Modes Inventory, and Difficulty in Emotion Regulation. SEM results indicated that the model fit with observed data ($CFI = 0.95$, $SRMR = 0.049$). The bootstrap results showed that the indirect effect of emotional dysregulation on schema modes and PPU was not significant ($\beta = -0.187$, $p = 0.067$). Given the non-significant mediation effect, these findings indicate that there is not an indirect effect between schema modes and PPU through emotional dysregulation, suggesting other mechanisms may be at play. Finally, these findings were examined in the context of the existing literature on PPU, and suggestions for future research were made.

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Problematic pornography use; compulsive sexual behavior; emotion regulation; schema modes; structural equation modeling

Introduction

Pornography usage has surged globally, largely due to widespread internet access. The largest pornographic website reports over 100 million daily visits (84% from mobile devices) and 36 billion visits annually, reflecting significant cultural, social, and economic implications. Pornography is defined as content that explicitly depicts sexual acts, primarily aimed at eliciting sexual arousal in viewers (Cardoso et al., 2022).

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Problematic pornography use (PPU) is increasingly recognised in the ICD-11 as a form of Compulsive Sexual Behavior Disorder (CSBD) (Cardoso et al., 2023). PPU is characterised by excessive and uncontrollable utilisation of pornography, leading to serious distress and functional impairment, such as job loss and relationship issues (Böthe et al., 2023). The severity of PPU is more closely linked to negative outcomes than frequency of use alone. Research classified pornography use into three groups: low and non-problematic (68–73%), high and non-problematic (19–29%), and high and problematic (3–8%). In this study, findings point out low and non-problematic use at 38%, high and non-problematic use at 49%, and high and problematic use at 13%. Individuals with high and problematic use reported heavier sexual compulsivity, depressive symptoms, sensitivity to boredom, lower self-esteem, and unmet psychological needs (Cardoso et al., 2023).

Recent psychometric research highlights the validity and reliability of problematic pornography use assessment tools across diverse cultural contexts. Böthe et al. (2024) conducted a large international study involving participants from 42 countries, examining how PPU manifests across different genders, sexual orientations, and cultural backgrounds. Their findings emphasise notable cross-cultural differences in the prevalence and expression of PPU, suggesting that cultural factors play a significant role in shaping individuals' experiences with pornography use. This study supports the use of standardised PPU measures in diverse populations while also highlighting the importance of considering cultural nuances when interpreting results in both research and clinical practice.

Recent cross-cultural research highlights that pornography use has increased worldwide, including in conservative societies, largely driven by internet proliferation and technological advances, especially during the COVID-19 pandemic (Ahorsu et al., 2023). Despite cultural differences, PPU has emerged as a significant concern globally, with prevalence rates influenced by gender, cultural norms, and accessibility. While Western countries have extensive literature, liberal attitudes, and specialised treatment options for PPU, many Asian and African countries face research gaps and limited treatment availability due to more conservative cultural beliefs. This underscores the importance of culturally sensitive approaches to understanding and addressing PPU. Moreover, PPU is linked to increased aggressive sexual behaviours and mental health impacts on victims across cultures, though attitudes towards pornography vary widely – from viewing it as a sexual education tool to emphasising its risks and problematic aspects (Ahorsu et al., 2023).

Research denotes that men, especially younger men, use pornography more often, especially during masturbation. They spend more time watching it, experience greater sexual arousal, and hold more positive mindset towards it (Cardoso et al., 2022). Gender differences in behavioural addictions are evident; for example, boys are exposed to pornography at younger ages than girls, watch more of it, and are more likely to identify as addicted. Adolescent males also show greater attentional bias towards sexual cues and higher rates of CSBD (Efrati et al., 2023).

Viewing sexual matter can activate the brain's reward system, leading to pleasure and arousal, but it also carries risks (Baranowski et al., 2019). For most people, pornography use is not problematic; however, for some, it can result in negative outcomes like depression, anxiety, relationship arguments, emotional dysregulation, social isolation, decreased sexual satisfaction, and defective functioning. Additionally, problematic online sexual activity is regularly coupled with other psychiatric disorders (Cardoso et al., 2023;

Yadollahi et al., 2021). Addiction to food, gambling, the internet, social media, exercise, work, or pornography is usually related to emotional disorders and cognitive distortions. people repeatedly struggle to manage their emotions and find it hard to control their behaviours. These addictions are typically associated with negative emotional experiences, leading people to engage in these behaviours as a form of escape and maladaptive self-soothing (Vieira et al., 2023).

Szumski et al. (2018) found that cognitive distortions significantly contribute to extreme sexual behaviours. Early maladaptive schemas (EMSs) are enduring, dysfunctional patterns of thoughts, emotions, and bodily sensations about oneself and relationships, formed early in life and playing a key role in chronic psychological disorders (Efrati et al., 2023; Vieira et al., 2023). When activated by certain situations, EMSs can lead individuals to adopt addictive behaviours as maladaptive coping strategies. Numerous studies have linked EMSs to various addictions, including substance abuse and CSB (Sakulsriprasert et al., 2023). CSB is often associated with negative beliefs about sexual fantasies, causing individuals to feel unable to control their behaviour and perceive themselves as 'bad'. Those with CSB frequently struggle with maladaptive sexual thoughts regarding their inability to regulate their actions (Efrati et al., 2021).

Efrati et al. (2021) studied the connection between CSB and cognitive distortions via EMSs in two groups: individuals with sexual disorders and sexual offenders vs non-sexual offenders. They identified several links: (1) Other-Directedness and Hypervigilance – individuals with CSB fear harming themselves and others due to their focus on sexual fantasies, leading to shame and guilt; (2) Impaired Limits – challenges in controlling sexual thoughts and behaviours; (3) Disconnection and Rejection – the belief that one's needs are unmet; and (4) Impaired Limits and Performance – the belief that one cannot function without help. As a result, individuals with CSB may engage in excessive sexual behaviours, such as pornography use or masturbation, to cope with emotional distress, often achieving only temporary relief.

Schema modes, introduced by Young and colleagues, represent the momentary emotional and cognitive states that arise from the activation of EMSs and coping styles (Dadomo et al., 2016). These modes reflect how schemas manifest dynamically in response to triggers, encompassing adaptive modes (e.g. healthy adult) and maladaptive modes (e.g. vulnerable child, punitive parent) (Salgó et al., 2021). Unmet emotional needs typically activate child modes characterised by feelings such as sadness, shame, anger, and vulnerability. While coping modes may offer temporary relief, they often contribute to long-term emotional dysregulation (Dadomo et al., 2016). Emotional dysregulation here refers to difficulties in managing and responding to emotional experiences in an adaptive manner, which is linked to the activation of maladaptive schema modes and internalised critical messages (Salgó et al., 2021). Given the close relationship between EMSs and schema modes, it is plausible PPU is associated with these modes, as individuals may engage in pornography as a maladaptive coping strategy to manage distress arising from activated EMSs.

Emotional dysregulation has been identified as a significant factor in PPU. It involves difficulties in controlling emotional responses, leading individuals to use pornography to escape or soothe negative emotional states (Cardoso et al., 2023). Research indicates that emotional dysregulation is associated with PPU, particularly when pornography is used avoidantly to cope with stress or negative affect (Antons et al., 2023). Moreover, emotional

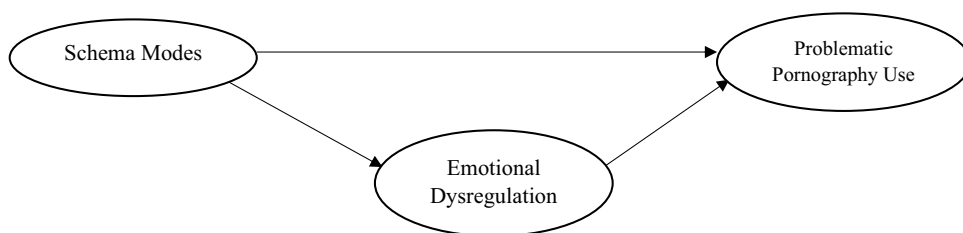


Figure 1. Proposed model of the present study.

dysregulation may mediate the relationship between EMSs and PPU, as maladaptive schemas can heighten emotional vulnerability, increasing reliance on maladaptive behaviours such as excessive pornography consumption (Cardoso et al., 2023; Darvish Molla et al., 2018). Understanding this interplay is crucial for developing effective interventions targeting both cognitive schemas and emotional regulation difficulties in individuals with PPU.

The present study

To our knowledge, no research has yet explored whether there is an indirect effect between schema modes and PPU through emotional dysregulation. This study aims to fill this empirical gap by investigating whether emotional dysregulation serves as a mediator between schema modes and PPU. We hypothesised that: (i) There is a direct effect between schema modes and emotional dysregulation, and (ii) There is a direct effect between emotional dysregulation and PPU. Additionally, we hypothesised that There is an indirect effect between schema modes and PPU through emotional dysregulation (Figure 1).

Method

Participants and procedure

The current study included 414 Iranian youth, from which 22 participants were excluded because they did not meet the inclusion criterion of abstaining from pornography use in the 6 months prior to the study. The final sample consisted of 392 individuals, predominantly male ($N = 392$; 77.6%), aged 15 to 25 years ($M_{\text{age}} = 20.90$; $SD = 2.51$). Most participants identified as single and heterosexual (see Table 1). A notable portion (17.1%) reported their first exposure to pornography at age 15, with many indicating they used pornography for 6 to 15 minutes. An online questionnaire was distributed via social media platforms (Telegram, Instagram) from June 23 to 19 July 2023. Participants were required to read and sign an informed consent form before completing the questionnaire. The study adhered to the Declaration of Helsinki guidelines, ensuring that all participants were informed their data would remain anonymous and used exclusively for research purposes. It should be noted that the use of Perplexity v3.2.0 as an AI assistant tool was only due to language and readability improvement. Table 1 presents the demographic characteristics of the participants who met the inclusion criteria and were included in the analyses.

Table 1. Participant sociodemographic characteristics.

n	Female	Male	%		sum
			Female	Male	
Gender	88	304	22.4	77.6	392
Sexuality					
Heterosexual	59	275	67	90.5	334
Homosexual	5	3	5.7	1	8
Bisexual	22	18	25	5.9	40
Other orientations	2	8	2.3	2.6	10
Pornography duration					
1–5	31	46	35.2	15.1	77
6–15	29	100	33	32.9	129
15–30	21	87	23.9	28.6	108
31–45	3	42	3.4	13.8	45
46–60	2	13	2.3	4.3	15

Measures

Pornography use (PU)

To assess the frequency of deliberate pornography use (PU), participants were first given a definition: pornography includes written, visual, and video content with sexual themes that may lead to arousal. They were then asked how often they had intentionally used pornography in the past six months, selecting from six response options: 1 (never), 2 (once in six months), 3 (once a month), 4 (once a week), 5 (several times a week), and 6 (every day or almost every day). Only those who had used pornography in the last six months were included in the analysis.

Schema Modes Inventory (SMI)

The Schema Modes Inventory (SMI) is a 124-item self-report questionnaire designed to evaluate 14 schema modes. Responses are rated on a scale from 1 ('never') to 6 ('always'), with higher scores indicating the dominance of a particular mode. The modes are grouped into four broader categories. The SMI has shown strong internal consistency and validity (Young et al., 2006). For this study, 42 items were selected from the Vulnerable Child, dysfunctional parent modes, and Coping modes categories. Hanaei et al. (2015) reported a high Cronbach's alpha of 0.90, indicating strong internal consistency for the scale, and the current research reported a Cronbach's alpha of 0.94, demonstrating strong reliability.

Difficulties in emotion regulation scale (DERS)

The Difficulties in Emotion Regulation Scale (DERS) is a self-report questionnaire consisting of 36 items designed to evaluate challenges in emotional regulation. It features six subscales and is scored on a scale from 1 ('almost never') to 5 ('almost always'), where higher scores reflect greater difficulties in regulating emotions. The DERS has shown high internal consistency and robust construct validity (Hallion et al., 2018). Azizi et al. (2010) estimated a Cronbach's alpha of 0.92 for this scale. In this study, the DERS yielded a Cronbach's alpha of 0.87, indicating strong reliability.

Problematic pornography use scale (PPUS)

The Problematic Pornography Use Scale (PPUS) is a 12-item self-report instrument designed to evaluate problematic pornography use, consisting of four subscales. Responses are scored on a scale from 0 ('never') to 5 ('always'), with higher scores reflecting increased problematic use. The PPUS has shown strong internal consistency and validity (Kor et al., 2014). The Persian version of this scale was validated by Darvish Molla and Nikmanesh (2017), demonstrating good reliability with a Cronbach's alpha of 0.85. In this sample, the scale demonstrated excellent internal consistency ($\alpha = 0.88$).

Data analysis

All analyses were performed using SPSS 26. Descriptive statistics including means, standard deviations, skewness, kurtosis, and internal consistency were calculated. Afterwards Confirmatory factor analysis (CFA) and structural equation modelling (SEM) were performed using Amos 24, employing the maximum likelihood estimation method to test the mediation model. Path analysis confirmed direct effect between schema modes and PPU without mediator. Potential mediator – emotional dysregulation – were incorporated into the model, and a bootstrap method ($N = 5000$) was used to create a 95% confidence interval for the significance of the mediating effect. We computed four-factor CFA model for PPUS, five-factor model for SMI and a six-factor model for DERS. Residual error covariances were specified between items 1–3 and 2–3 of the PPUS; and between items 2–3 and 10–15 of the DERS; and between items 3–6, 3–4, 4–6, and 1–2 of the SMI because they were semantically related. Various indices are employed to evaluate model fit in CFA and SEM, including the chi-square goodness-of-fit statistic (χ^2), Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI). For a model to be considered a good fit, SRMR and RMSEA values should be below 0.08, while CFI and TLI values should equal or exceed .90. Furthermore, CFI and TLI values greater than .95, combined with SRMR and RMSEA values under .05, indicate an excellent model fit (Marsh et al., 2004; Schermelleh-Engel et al., 2003).

Results

Preliminary results

Prior to data analysis, we checked for missing data, univariate outliers, and the normality of the distribution. No missing data was identified. Univariate outliers were absent. All the variables demonstrated normal distributions, with skewness values ranging from 0.46 to 0.60 and kurtosis values ranging from -0.02 to -0.45 (see Table 2). The skewness and kurtosis values for the all the variables fell within the range of -2 to $+2$, which is

Table 2. Descriptive statistics among measure.

Variables	1	2	3	M(SD)	α	Skewness	Kurtosis
1. SM	1			2.80(0.79)	0.94	0.53	-0.02
2. DER	0.70**	1		2.53(0.64)	0.87	0.46	-0.45
3. PPU	0.51**	0.37**	1	1.43(0.95)	0.88	0.60	-0.18

Table 3. Fit indices of confirmatory factor analysis.

	Factor loading	SRMR	RMSEA	TLI	CFI	χ^2/DF	P	DF	χ^2
SM	0.43–0.82	0.06	0.05	0.90	0.91	1.96	0.001	694	1358.87
EDR	0.58–0.86	0.06	0.06	0.93	0.94	2.47	0.001	118	292.05
PPU	0.62–0.95	0.04	0.04	0.98	0.99	1.71	0.001	118	78.50

considered acceptable for demonstrating normality (George, 2011). Given that our data met these criteria, we concluded that the assumption of normality was reasonably met for the purposes of our analyses. Additionally, variance inflation factor (VIF) and tolerance values were evaluated for all variables in the study. It is advised that VIF values remain below 10 and tolerance values exceed 0.20 (Kaynakçı & Güneri, 2023). In this study, both VIF values are 1.96, while both tolerance values were 0.51. Thus, our analysis of both VIF and tolerance indicates that there is no violation of the multicollinearity assumption.

Descriptive statistics

Table 2 displays the descriptive statistics, including means, standard deviations, skewness, kurtosis, internal consistency, and bivariate correlations.

SM = Schema Modes, DER = Difficulties in Emotion Regulation, PPU = Problematic Pornography Use.

Confirmatory factor analysis

The measurement model of the scales shows adequate goodness of fit, as indicated by the fit indices in Table 3.

SM = Schema Modes, EDR = Emotional Dysregulation, PPU = Problematic Pornography Use.

Structural equation model

Regarding the structural equation analysis, the proposed model excellently fits with our data ($\chi^2(69) = 216.20$, $p < .001$, CFI = 0.95, SRMR = 0.049). The structural equation model with standardised estimation parameters is depicted in Figure 2. As depicted in Figure 2, schema modes exhibit significant positive direct effects on both PPU ($\beta = 0.82$, $p < 0.01$) and emotional dysregulation ($\beta = 0.81$, $p < 0.01$). Concerning the indirect effects, there is not an indirect effect between schema modes and PPU through emotional dysregulation ($\beta = -0.187$, SE = 0.107, $p = .067$, 95% CI [-0.421, 0.012]). Overall, 42% of the variance in PPU can be attributed to the variables.

Mediation analysis

Mediation analysis was conducted using Amos 24 to examine whether there is an indirect effect between schema modes and PPU through emotional dysregulation. We conducted a bootstrap analysis with 5,000 samples for the mediation analysis (Table 4). The indirect path coefficient of schema modes to PPU mediated by 95% confidence was not significant.

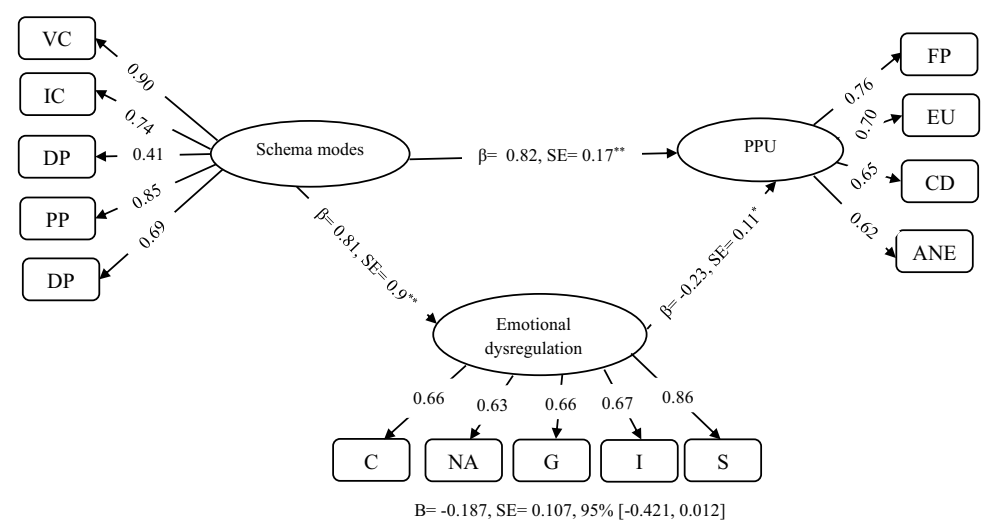


Figure 2. Model depicting the indirect effect between schema modes and PPU through emotional dysregulation. Note. B = unstandardized coefficient; SE = standard error, * = significant at the $\alpha = 0.05$ level; ** = significant at the $\alpha = 0.01$ level.

Table 4. Mediation analysis.

Independent variable	Mediator	Dependent variable	Total effect	Direct effect coefficient	Indirect effect coefficient	Result
Schema modes	Emotional dysregulation	PPU	0.630	0.818	-0.187	No mediation

PPU = Problematic Pornography Use.

Discussion

In this study, we investigated a potential explanatory mechanism model for understanding the connection between schema modes, PPU, and emotional dysregulation. Specifically, the novelty of this research lies in examining how schema modes associate with PPU while considering emotional dysregulation as the mediator.

The strong association between Schema Modes and emotional dysregulation found consisting with an abundant body of literature (Abasi Rad et al., 2023; Dadomo et al., 2016; Kanari et al., 2024; Pilkington et al., 2024; Ramshe et al., 2023; Salgó et al., 2021) which indicates that difficulties in regulating emotions are linked to maladaptive schema modes, impacting interpersonal relationships. Schema-based therapies can enhance emotion regulation skills and improve quality of life (Parvzian et al., 2022). This line up with schema therapy, which posits that EMSs formed from negative childhood experiences hinder emotional regulation (Salgó et al., 2021). These results support a study by Abasi Rad et al. (2023), which showed that schema-based therapies can help improve the ability to regulate emotions in delinquent adolescents, which leads to increased self-awareness and reduced emotional dysregulation. Additionally, research by Kanari et al. (2024) confirmed a significant link between different personality dimensions and emotional regulation difficulties, which could indicate the effect of schema modes on emotional dysregulation.

Regarding hypothesis two, a significant direct effect was found between emotional dysregulation and PPU. Several findings suggest that pornography use is not only a temporary solution to reduce emotional distress, but may actually exacerbate emotional problems (Antons et al., 2023; Cardoso et al., 2022, 2023; Darvish Molla et al., 2018; Musetti et al., 2022; Pettorruso et al., 2020; Rahm-Knigge et al., 2023). However, other research has shown that some individuals may use pornography as a tool for sexual education or to enhance sexual satisfaction without experiencing emotional dysregulation. This further highlights the complexity of the relationship between these two variables and highlights that not all individuals respond to the effects of pornography in the same way (Hald & Malamuth, 2008).

Concerning indirect effects, there was not an indirect effect between schema modes and PPU through emotional dysregulation. As this study is the first of its kind to examine the relationship between schemas and PPU, and due to the lack of resources that have targeted schemas in relation to pornography, similar studies instead will be referred to. Inconsistent with the findings of the present study, the results of several studies (Efrati et al., 2021, 2023; Elmquist et al., 2016; Quinta Gomes & Nobre, 2012; Sakulsriprasert et al., 2023; Soltani et al., 2016; Vieira et al., 2023) indicate a positive relationship between EMSs and behavioural addictions, including PPU. People with more active maladaptive schemas, especially in the areas of disconnection and rejection and impaired limits, are more likely to use pornography to manage their negative emotions.

Limitations

The present study identifies several limitations. First, its cross-sectional design limits the ability to draw causal inferences and suggests that future research should focus on collecting longitudinal data. One of the main limitations of this study is that it was conducted online. This method may affect the type and quality of data collected; for example, the lack of complete control over the respondents' environment could lead to unrealistic or incomplete responses. The data collection instrument was self-report. This type of instrument may be affected by social and personal biases, especially in topics such as pornography where respondents may be inclined to provide socially desirable responses. This study is also the first to examine the role of schema modes in relation to pornography and emotional dysregulation. The lack of previous research in this area can lead to a lack of a strong basis for comparing and analysing the results. Regarding to pornography, the role of culture is also very important. The results of this study may be influenced by the specific cultural values and attitudes of Iranian society, which can make it challenging to generalise the results to other societies. Also, our study sample consisted mainly of young people, which may limit the generalisation of the results to other age groups, because attitudes and behaviours related to pornography may differ in different age groups. Given the specific characteristics of the study population as well as the data collection methods, it may be difficult to generalise the results to other societies. These limitations should be considered when interpreting the findings.

Conclusion

Besides having limitations, the present study is unique in that it is the first study to examine the indirect effect of schema modes and PPU through emotional dysregulation.

The findings of the current study reveal that emotional dysregulation does not mediate the link between schema modes and PPU. Yet, it is important to further investigate schema modes and emotional dysregulation in individuals with PPU, to investigate specific areas of life that are affect, and to evaluate behavioural interventions and cognitive restructuring.

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Disclosure statement

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

Data availability statement

The data that support the results of this study are available from the corresponding author upon reasonable request.

Open scholarship



This article has earned the Center for Open Science badge for Open Data. The data are openly accessible at <https://osf.io/t6udp/>.

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