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RESEARCH PAPER

# INTERPERSONAL GUILT AND PROBLEMATIC ONLINE BEHAVIORS: THE MEDIATING ROLE OF EMOTION DYSREGULATION

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## Abstract

*Objective*: The positive association between problematic Internet use (PIU) and emotion dysregulation (ED) is well documented. Research has also found that interpersonal guilt is positively associated with ED. Nevertheless, the influence of interpersonal guilt on PIU has been scarcely examined. In the current study, we investigated the relationships among the three constructs, and tested if emotion dysregulation mediates the association between interpersonal guilt and different types of PIU, namely problematic online gaming, problematic social media use, and problematic online pornography use.

*Method*: A sample of 434 adult participants (210 males, 48.4%) aged between 18 and 69 years old completed self-reported measures on interpersonal guilt, ED, and PIU. A structural equation modeling (SEM) framework was used to test the mediation models.

*Results*: SEM analyses showed that ED mediates the relationship between interpersonal guilt as antecedent, and problematic online gaming, problematic social media use, and problematic online pornography use as outcomes.

*Conclusions*: Our findings suggest that emotion dysregulation deriving from experiences of interpersonal guilt can amplify the risk of using gaming, social media, and online pornography in a problematic way. Implications for prevention and treatment of PIU are discussed.

**Key words**: interpersonal guilt, emotion dysregulation, problematic gaming, problematic social media use, problematic online pornography use

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## Introduction

Understanding the origins of addictive or otherwise problematic online behaviors is critical for their prevention and treatment. Accordingly, a need exists to propose and test theoretical models that help explain how individuals might develop a problematic use of Internet services and applications. From a psychological standpoint, we posit that interpersonal guilt represents a key emotion to understand problematic Internet use (PIU), and that emotion dysregulation mediates the relationship between guilt and PIU.

### *Guilt*

Guilt refers to a painful experience related to the violation of an internalized norm (Haidt, 2003). People may invoke feelings of guilt for many reasons, such as apologizing for misdeeds, manipulating others, declining appointments, disciplining children, and so on. Notably, the anticipation of guilt leads individuals to perform or avoid an extraordinary variety of actions (Baumeister et al., 1994). Feelings of guilt may also involve remorse and regret, and they act as a powerful motive for reparative actions (Donohue & Tully, 2019; Lewis, 1971; Tilghman-Osborne & Felton, 2010).

According to a classical psychoanalytic perspective, guilt derives from the violation of a moral norm, which generates an intrapsychic conflict between the ego and the super-ego: in the psychodynamic tradition, guilt has the function of blocking transgressive behaviors through fear of internal and external punishment (Freud, 1923, 1929; Klein, 1935, 1946). Therefore, guilt might represent a powerful intrapsychic force that sometimes becomes excessive, irrational, and pathogenic (O'Connor et al., 1997).

Complementing the classical psychoanalytic position, which has given greater emphasis to the intrapsychic conflict, the interpersonal perspective (Baumeister et al., 1994) has highlighted the socially adaptive role of guilt (Carnì et al., 2013). According to this perspective, guilt emerges from the belief that one has caused unjustified harm to another person or did not behave in an altruistic way (Hoffman, 1982; Tangney & Dearing, 2003). Therefore, guilt can also

have the positive function of improving interpersonal relationships by generating preoccupation with others' well-being (Tangney, 1991; Tangney et al., 1995).

Remarkably, guilt is interpersonal in its origin (Gazzillo et al., 2020). In children, guilt emerges from empathic discomfort with others' suffering: it involves an implicit process of attributing responsibility for this suffering to oneself, together with the belief that such pain can be alleviated or repaired (Bush, 2005; Friedman, 1985). Accordingly, guilt may arise from any attitude or behavior, even the healthiest, if the individual has the impression that he or she can cause pain to beloved others or can jeopardize the relationship with them (Weiss, 1993).

Gazzillo (2016) highlighted a fundamental distinction between conscious and unconscious guilt. He argued that conscious guilt can promote the identification of reparative solutions to the damage done to others; on the contrary, unconscious guilt can represent a "verdict without appeal", as the origins of guilt are not recognized, and thus guilt becomes a frightening and dysregulating internal experience with no possibility of interpersonal repair. As a result, when people are prone to unconscious guilt and do not have adequate emotion regulation strategies, guilt can become overwhelming and can foster self-punitive behaviors (Carnì et al., 2013) and other psychological problems (Berghold & Lock, 2002; Bruno et al., 2009; Bush, 2005).

The Control-Mastery Theory (CMT; Gazzillo, 2012; Gazzillo et al., 2020; Silberschatz, 2013; Weiss, 1993) conceptualizes maladaptive feelings of guilt as a function of the internalized object relationships with traumatizing caregivers. In fact, adverse experiences in family relationships might generate pathogenic beliefs in the child (Gazzillo et al., 2020), potentially damaging his or her self-image, life satisfaction, and well-being (Santoro et al., 2021a). These pathogenic beliefs may engender four types of interpersonal guilt, namely survivor's guilt, separation-disloyalty guilt, omnipotent responsibility, and self-hate guilt.

Survivor's guilt is experienced when individuals believe that they have more success, satisfaction, luck or positive qualities than other significant people in their life. Accordingly, an individual with survivor's guilt believes that beloved others feel hurt or humiliated by his or her qualities.

Separation-disloyalty guilt stems from the fear that becoming independent and having personal values and thoughts will be hurtful to loved ones. This often leads to difficulties concerning separation, together with feelings of being trapped in unpleasant relationships.

Omnipotent responsibility is a consequence of feeling that one has the power and duty to take care of loved ones (especially of one's mother; Asch, 1976) and to make them happy. This implies a pathogenic belief that taking care of oneself would be a sign of neglect and disrespect toward beloved others who are suffering or needy. Notably, this type of interpersonal guilt is related to the phenomenon of the "parental child" (Cleveland, 1981), that is, to the family dynamics in which children become—more or less implicitly—responsible for the well-being and care of the family group (Bifulco et al., 2014).

Self-hate guilt arises from the assumption that criticism and offences suffered by parents reflect their extreme sacrifice in rearing the child (Asch, 1976; Gazzillo, 2016). Self-hate guilt induces the individual to perceive self-disgust and to think about oneself as inadequate and unworthy. Strictly related to traumatic shame experiences (Schimmenti, 2021), self-hate guilt is not experienced for something one has done, but for the way one is—this type of guilt has been evocatively described by Fairbairn (1943) in his famous sentence: "it is better to be a sinner in a world ruled by God than to live in a world ruled by the Devil" (p. 93).

All these types of guilt are interpersonal in their origins and effects, as they derive from actual interactions with caregivers during childhood and are especially experienced in actual interactions with beloved others. Research has confirmed the positive associations between interpersonal guilt and low self-esteem (De Luca et al., 2021), anxiety and depression symptoms (Fimiani et al., 2021), posttraumatic stress symptoms (Wang et al., 2020), and low levels of well-being (Gazzillo et al., 2018). Furthermore, it has been found that interpersonal guilt is positively associated with obsessive-compulsive disorders (Hennig-Fast et al., 2015), depressive disorders (Rahim & Rashid, 2017), maladaptive eating behaviors (Vizin et al., 2022), and suicidal ideation (Kealy et al., 2021). Interpersonal guilt is also associated with maladaptive emotion regulation strategies, including worry and rumination that might foster anxiety and depression symptoms (Leonardi et al., 2020).

## *Problematic Internet Use*

PIU indicates a maladaptive use of the Internet. PIU is often manifested through an irresistible need to use Internet services and applications for longer periods than expected, aggravated by significant social or emotional discomfort, and/or impairment resulting from their use (Spada, 2014; Tokunaga & Rains, 2016). Starting from the observation that PIU can negatively impact psychological well-being (Chen, 2012), most scholars have considered PIU as an addictive disorder (Young, 1998; Griffiths, 2005), whereas other scholars have conceived it as a maladaptive coping strategy (Kardefelt-Winther, 2014) or as a form of "self-medication" for traumatic stress and underlying psychopathology (Schimmenti & Caretti, 2010).

The conceptualization of PIU as an addictive disorder is under discussion mainly because it does not provide information on the origins and psychopathological processes that may favour a dysregulated and compulsive use the Internet applications (Billieux et al., 2015; Perales et al., 2020). Notably, many psychological variables underlying PIU have been identified in the literature, including maladaptive personality features (Gervasi et al., 2017; Musetti et al., 2019), childhood trauma (Musetti et al., 2021; Wéry et al., 2019; Yates et al., 2012), dissociation (Guglielmucci et al., 2019), insecure attachment (Costanzo et al., 2021; Musetti et al., 2018, 2022; Schimmenti et al., 2021; Santoro et al., 2021b), and so on. Among the psychological variables for which robust associations have been reported, emotion dysregulation seems to play a key role in PIU (Di Blasi et al., 2019, 2020; Liu & Ma, 2019; Pettorruso et al., 2020; Schimmenti et al., 2018), as an important antecedent of many problematic online behaviors.

## *Emotion dysregulation*

Emotion dysregulation refers to a difficulty identifying, differentiating, recognizing, and modulating feelings with flexibility and in accordance with the environmental and relational stimuli (Gross & Thompson, 2007; Gross, 2013). People may consciously or unconsciously activate different strategies to regulate their emotions (Palmieri et al., 2022). These strategies

may be more or less appropriate to particular contexts than others, implying that the regulation should be flexibly maintained and adapted when circumstances change (Bonanno et al., 2004). Failures of emotion regulation strategies, or the use of a given strategy in an inappropriate context (e.g., using excessive attentional control in a situation of urgency), may lead to emotion dysregulation.

A recent literature review (Gioia et al., 2021) shows that people with emotion dysregulation might be more prone to PIU. Research has shown that emotion dysregulation is associated with problematic use of different Internet services and applications, including videogames (Estévez et al., 2017; Liese et al., 2020; Marchica et al., 2019), social media (Hormes et al., 2014), and pornography (Cardoso et al., 2022).

## *The relationship between PIU, emotion dysregulation, and guilt*

Different types of problematic online activities have been linked with emotion dysregulation. Online gaming is a popular entertainment activity which may positively affect different areas of personal functioning, promoting social interactions, improving individual technical skills and sense of mastery, offering fun experiences, and reducing stress (Arbeau et al., 2020). However, problematic gaming activities have been widely reported in the literature. Problematic gaming leads to loss of control over gaming, engagement in gaming despite negative consequences, conflict or interference due to gaming, and impairment in individual functioning (Castro-Calvo et al., 2021). Accordingly, the fifth revision of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) included the "Internet Gaming Disorder", among the clinical syndromes that required further study (American Psychiatric Association, 2013), and the eleventh revision of the International Classification of Diseases includes the "Gaming Disorder" (GD) among the "Disorders due to substance use or addictive behaviours" (World Health Organization, 2019). Problematic online gamers may excessively use games for escapism motives (Deleuze et al., 2019) and to regulate negative emotional experiences (Di Blasi et al., 2019). Research has shown that problematic gaming is associated with emotion dysregulation, e.g., with impulsivity (Şalvarlı & Griffiths, 2022) and with difficulties identifying and describing feelings (Maganuco et al., 2019).

Social media are Internet platforms that allow individuals to share contents and information with others. Social media platforms provide people with new opportunities for satisfying their interpersonal needs and desires— e.g., social media allow individuals to share their feelings and to receive support from others (Kross et al., 2021). However, an excessive engagement in social media might negatively affect mental health (Boursier et al., 2020; Ruggieri et al., 2020). Hormes and colleagues (2014) have found that people suffering from problematic social media use display more difficulties in emotion regulation, including experiential avoidance, lack of acceptance of emotional responses, limited access to emotion regulation strategies, poor impulse control and difficulties in engaging goal-oriented behaviors, than other people. Also, Zsido and colleagues (2021) have found that maladaptive emotion regulation strategies mediated the relationship between social anxiety and problematic social networking sites use.

Several motivations may lead individuals to watch pornographic contents, including sexual pleasure, sexual curiosity, emotional distraction or suppression, stress reduction, satisfaction of fantasies, boredom avoidance, lack of sexual satisfaction, and self-exploration (Bőthe et al., 2021). Cooper (1998) suggested that three specific properties of the Internet platforms, namely accessibility, affordability, and anonymity, might increase the likelihood of compulsively using online pornographic contents. Despite these properties might concur to the development of problematic pornography use, research suggests that individuals who are excessively engaged in online pornography watch pornographic videos in order to regulate mood (Wéry & Billieux, 2016), to avoid unpleasant mental states and actual problems (Wéry et al., 2019), and also because of their high levels of impulsivity and dysfunctional coping strategies (Antons et al., 2019).

In contrast, few studies have investigated the relationship between guilt and PIU. Among them, Shi and colleagues (2019) found that individuals suffering from problematic gaming reported increased guilt for their gaming activities. There is also evidence that social media users tend to report feelings of guilt when they fail to meet expectations about their availability on social networks (Fox & Moreland, 2015; Hall, 2017). Finally, young people using online pornography tend to perceive increased levels of guilt (Sabina et al., 2008). These findings on PIU are also consistent with research indicating a positive association between interpersonal guilt and addictive behaviors, including gambling (Locke et al., 2013) and substance use (Locke et al., 2015).

Research findings thus indicate a positive association between excessive engagement in Internet activities and increased levels of guilt. However, it is difficult to establish whether guilt represents a risk factor for PIU or constitutes a specific response to maladaptive behaviors in the Internet. According to CMT, interpersonal guilt should precede problematic online behaviors and might even foster them, as guilt derives from failures in attachment experiences during childhood and implies pathogenic beliefs about self and others that generate negative or dysregulated feelings (Gazzillo et al., 2020); in this context, excessive behaviors in the Internet might serve to counteract such feelings. Notably, this perspective seems in line with the compensatory model of PIU (Kardefelt-Winther, 2014), which suggests that individuals might escape into virtual realities as a way to find relief from painful feelings (Giardina et al., 2021; Schimmenti & Caretti, 2010, 2017).

## *Aims of the study*

In line with the theoretical premises, we hypothesized that (a) interpersonal guilt would increase PIU, as people with high levels of guilt might excessively use the Internet to cope with distressing feelings (Kardefelt-Winther, 2014); (b) interpersonal guilt would also evoke dysregulated emotional responses, as high levels of guilt imply pathogenic beliefs about self and others that can damage or even disrupt the capacity for emotion regulation (Gazzillo et al., 2021; Leonardi et al., 2020); (c) emotion dysregulation would increase the risk to excessively use the Internet, as a strategy for self-regulating and "anesthetizing" disturbing emotional states (Schimmenti & Caretti, 2010), such as guilt. Thus, we expected that interpersonal guilt predicted PIU, and that emotion dysregulation partially mediated their relationship. Our predictions were tested on data

concerning three commonly identified problematic online behaviors: problematic gaming, problematic social media use, and problematic online pornography use.

## Materials and Methods

### *Participants and Procedures*

The study sample consisted of 434 adult participants from the community (224 females, 51,6%). Participants ranged in age between 18 and 69 years old (M = 32.84, SD = 12.01). The average years of education in the sample was 14.33 (SD = 2.83). No significant sex differences were found for age or years of education.

Participants were recruited through an anonymous online survey posted on social media. The online survey comprised an informed consent schedule and a battery of self-reported measures. The survey was advertised as research designed to investigate the relationship between emotional functioning, interpersonal relationships, and Internet use, and took approximately 20 minutes to complete. No incentive was given. All procedures were in accordance with Helsinki Declaration. Ethical approval of the study was obtained from the IRB for psychological research of the UKE – Kore University of Enna.

### *Measures*

The *Interpersonal Guilt Rating Scale – 15s* (IGRS-15s; Gazzillo et al., 2018) is a self-report measure that assesses interpersonal guilt through 15 self-report statements rated on a 5-point Likert scale (1 = "very uncharacteristic", 5 = "very characteristic"). The IGRS-15s comprises three subscales evaluating survivor's guilt (e.g., "I conceal or minimize my successes out of concern for making less successful people feel bad"), omnipotent guilt (including both separation/disloyalty guilt and omnipotent responsibility guilt; e.g., "I feel overly responsible for other people's well-being"), and self-hate guilt (e.g., "I believe that if other people really know me, they would want nothing to do with me"). The measure has demonstrated adequate test-retest reliability and validity across Italian samples (Gazzillo et al., 2018; Faccini et al., 2020). A total score is also calculated by averaging the subscale scores. In the current study, Cronbach's α was .80 for survivor's guilt, .77 for omnipotent guilt, and .80 for self-hate guilt.

The *Difficulties in Emotion Regulation Scale* (DERS; Gratz & Roemer, 2004; Italian validation by Sighinolfi et al., 2010) is a self-report instrument that assesses difficulties in emotion regulation. In this study, we used the short form of the DERS comprising 18 items (DERS-18; Victor & Klonsky, 2016) Items are rated on a 5-point Likert scale ranging from 1 ("almost never") to 5 ("almost always"). The DERS-18 includes a total scale and six subscales, which evaluates lack of emotional awareness (Awareness; e.g., " I am attentive to my feelings" reverse scored); lack of emotional clarity (Clarity; e.g., " I have difficulty making sense out of my feelings"); lack of acceptance of one's emotions when distressed (Non-acceptance; e.g., "When I'm upset, I become embarrassed for feeling that way"); lack of ability to engage in goal-directed cognition and behavior when distressed (Goals; e.g., "When I'm upset, I have difficulty concentrating"); lack of ability to manage one's impulses when distressed (Impulse; e.g., "When I'm upset, I have difficulty controlling my behaviors"); and lack of access to effective strategies for feeling better when distressed (Strategies; e.g., "When I'm upset, I believe that wallowing in it is all I can do"). The DERS-18 has shown convergent, concurrent, and predictive validity, as well as high internal consistency (Victor & Klonsky, 2016). In the current study, Cronbach's α was .89 for total score, .88 for goals, .88 for impulse, .82 for clarity, .78 for non-acceptance, .77 for strategies, and .71 for awareness.

The *Internet Gaming Disorder Scale – Short Form* (IGDS9-SF; Pontes & Griffiths, 2015; Italian validation by Monacis et al., 2016) is a self-report instrument that evaluates the maladaptive engagement in gaming in accordance with IGD-related criteria (i.e., preoccupation, withdrawal, tolerance, loss of control, loss of interests, overuse despite negative consequences, lies related to gaming activities, escapism motives, and functional impairing; American Psychiatric Association, 2013). Participants were asked to rate 9 items on a 5-point Likert scale (1 = "never"; 5 = "very often"). An example of item is: "Have you lost interests in previous hobbies and other entertainment activities as a result of your engagement with the game?". The IGDS9-SF demonstrated adequate psychometric properties, including structural invariance (de Palo et al., 2019), in several countries (Evren et al., 2018; Pontes & Griffiths, 2016), In the current study, Cronbach's α of the scale was .90.

The *Bergen Social Media Addiction Scale* (BSMAS; Andreassen et al., 2016; Italian validation by Monacis et al., 2017) is a self-report instrument assessing symptoms of social media addiction, including salience, mood change, tolerance, withdrawal, conflict, and relapse, through 6 questions. Each item is rated on a 5-point Likert scale (1 = "very rarely", 5 = "very often"). An example of item is: "How often during the last year have you used social media so much that it has had a negative impact on your job/studies?". The BSMAS has been translated in different languages, demonstrating satisfying psychometric characteristics (Chen et al., 2020; Stănculescu, 2022). In the current study, Cronbach's α was .82.

The *Cyber Pornography Addiction Test* (CYPAT; Cacioppo et al., 2018) is a self-report instrument assessing problematic online pornography use. The CYPAT includes 11 first-person statements rated on a 5-point Likert scale (1 = "never", 5 = "always"). An example of item is: "Sometimes I feel unable to control the watching of porn sites". The CYPAT demonstrated good reliability and convergent validity (Cacioppo et al., 2018) In the current study, Cronbach's α was .88.

A socio-demographic schedule was also administered to collect information on sex, age, and years of education of participants.

### *Data Analysis*

Descriptive statistics were calculated for all the variables in the study. Sex differences were examined through t-test. Pearson's r correlations were calculated to examine the associations between the investigated variables. Subsequently, structural equation modeling (SEM) analyses were performed using the R-package Lavaan (Rosseel, 2012). Mardia tests of multivariate skewness and kurtosis were used to explore data distribution related to each model. Data for all models were not-normally distributed, thus the diagonally weighted least squares estimation (DWLS) method was employed. In accordance with our hypotheses, Model 1 tested the mediating effect of emotion dysregulation in the relationship between interpersonal guilt and

problematic gaming. Model 2 estimated the mediating effect of emotion dysregulation in the relationship between interpersonal guilt and problematic social media use. Finally, in Model 3, we tested the mediating effect of emotion dysregulation in the relationship between interpersonal guilt and problematic online pornography use. For all three models, the latent variable for emotion dysregulation was computed through DERS-18 subscale scores (i.e., non-acceptance, goal, impulse, awareness, strategies, and clarity) as indicators, and the latent variable for interpersonal guilt was calculated through IGRS-15s subscale scores (i.e., survivor's guilt, omnipotent guilt, and self-hate guilt). Also, the latent variable for problematic gaming was computed employing IGDS9-SF items as indicators in the Model 1, the latent variable for problematic social media use was computed using BSMAS items as indicators in the Model 2, and the latent variable for problematic online pornography use was computed using CYPAT normalized items as indicators in the Model 3. In fact, previous research supported single-factor structures for IGDS9-SF (de Palo et al., 2019), BSMAS (Monacis et al., 2017), and CYPAT (Cacioppo et al., 2018). However, all CYPAT items displayed excessive, and in some cases even extreme, values for skewness and kurtosis (all z's > 1.96). Thus, we transformed CYPAT items using IDF method (Templeton, 2011) before performing SEM. The goodness of fit of SEM models were evaluated through the following indices: the $\chi 2/df$ ratio, for which values $\leq 2$ indicate a good fit and values $< 4$ indicate an acceptable fit; the root-mean-square error of approximation (RMSEA), for which values $\leq 0.05$ indicate a good fit; the comparative fit index (CFI) and the Tucker-Lewis Index (TLI), with values $> .95$ indicating a good fit and the standardized root-mean-square residual (SRMR), for which a value $\leq 0.08$ is recommended for accepting a model (Hooper et al., 2008; Hu & Bentler, 1999).

## Results

Descriptive statistics and sex differences are reported in **table 1**. Significant sex differences were observed. Males reported higher scores than females on problematic online gaming and problematic online pornography use; females reported higher scores than males on problematic social media use. No significant sex differences were found for interpersonal guilt and emotion dysregulation.

Pearson's r coefficients are reported in **table 2**. Age was negatively correlated with years of education, emotion dysregulation, interpersonal guilt, problematic online gaming, and problematic social media use. Interpersonal guilt was positively correlated with emotion dysregulation, problematic online gaming, problematic social media use, and problematic online pornography use. Moreover, emotion dysregulation was positively correlated with problematic online gaming, problematic social media use, and problematic online pornography use. Problematic online gaming, problematic social media use, and problematic online pornography use were positively correlated among them.

SEM for Model 1 showed a mediating effect of emotion dysregulation on the relationship between interpersonal guilt and problematic gaming. The model yielded a significant $\chi 2$ value ($\chi 2(132) = 183.138$, $p = .002$). Further examination of fit indices confirmed that the mediation model fitted well [RMSEA = .030 (90% CI: .018–.040); SRMR = .060; CFI = .988; TLI = .986]. The mediation model explained 59.6% of emotion dysregulation variance, and 78.2% of problematic gaming variance. The direct effect of interpersonal guilt on problematic gaming was significant ($\beta = .37$, $p < .001$); moreover, interpersonal guilt was associated with emotion dysregulation ($\beta = .64$, $p < .001$), which in turn was associated with problematic gaming ($\beta = .13$, $p = .007$). The standardized total effect in the model

**Table 1.** *Descriptive statistics and gender differences*

| | Full sample (N = 434) | | | Males (n = 210) | | Females (n = 224) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | M | (SD) | Range | M | (SD) | M | (SD) | $t_{(432)}$ | *p* |
| *Age* | 32.84 | (12.01) | 18-69 | 32.47 | (11.52) | 33.18 | (12.47) | -.61 | .54 |
| *Years of Education* | 14.33 | (2.84) | 8-21 | 14.36 | (2.77) | 14.31 | (2.90) | .16 | .87 |
| *Interpersonal Guilt* | 2.30 | (.78) | 1-5 | 2.28 | (.79) | 2.32 | (.77) | -.62 | .54 |
| *Emotion Dysregulation* | 43.44 | (12.78) | 18-81 | 42.41 | (11.74) | 44.41 | (13.65) | -1.63 | .11 |
| *Problematic Gaming* | 14.56 | (7.24) | 9-45 | 16.51 | (7.95) | 12.72 | (5.96) | 5.65 | <.01 |
| *Problematic Social Media Use* | 11.21 | (4.81) | 6-30 | 10.57 | (4.93) | 11.80 | (4.62) | -2.69 | .01 |
| *Problematic Online Pornography Use* | 13.77 | (5.23) | 11-46 | 15.48 | (6.41) | 12.18 | (3.03) | 6.92 | <.01 |

**Table 2.** *Pearson's r correlations between the investigated variables*

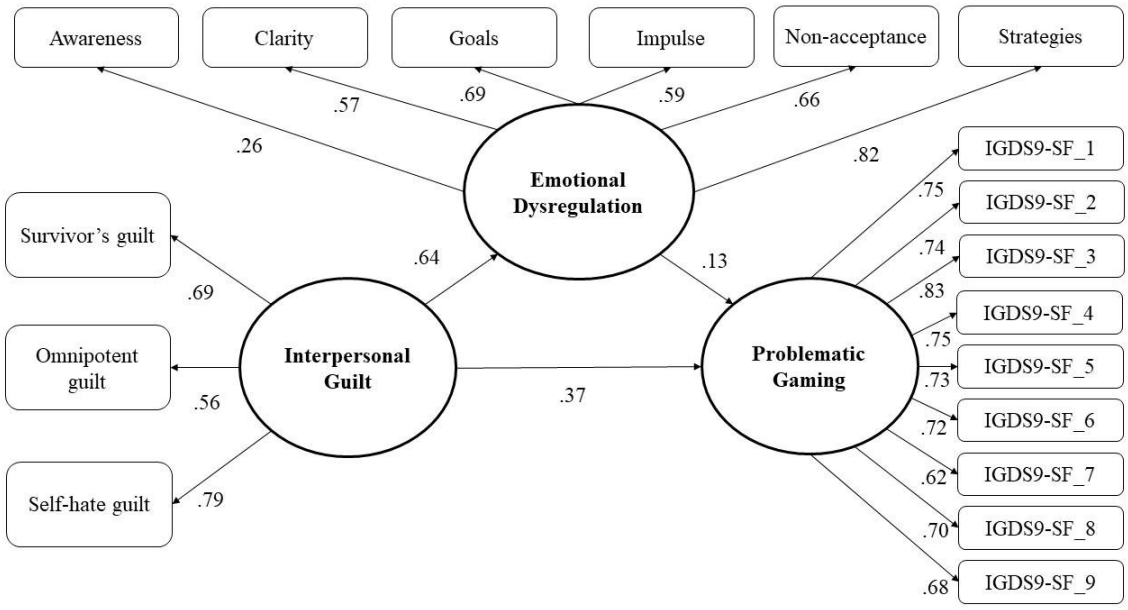
| | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| *1. Age* | -.11* | -.14** | -.22*** | -.23*** | -.22*** | -.08 |
| *2. Years of Education* | - | -.05 | -.02 | -.03 | .03 | .07 |
| *3. Interpersonal Guilt* | | - | .49*** | .38*** | .29*** | .24*** |
| *4. Emotion Dysregulation* | | | - | .33*** | .30*** | .20*** |
| *5. Problematic Gaming* | | | | - | .26*** | .40*** |
| *6. Problematic Social Media Use* | | | | | - | .16** |
| *7. Problematic Online Pornography Use* | | | | | | - |

*Note.* *p < .05, **p < .01, ***p < .001

was .46 (p<.001); the standardized indirect effect of interpersonal guilt on problematic gaming via emotion dysregulation was .08 (p=.002). The standardized estimates of Model 1 are shown in **figure 1.**

problematic social media use was significant (β = .22, p < .001); furthermore, interpersonal guilt was associated with emotion dysregulation (β = .62, p < .001), which in turn was associated with problematic social media

**Figure 1.** *Model depicting the mediating effect of emotion dysregulation on the relationship between interpersonal guilt and problematic gaming*

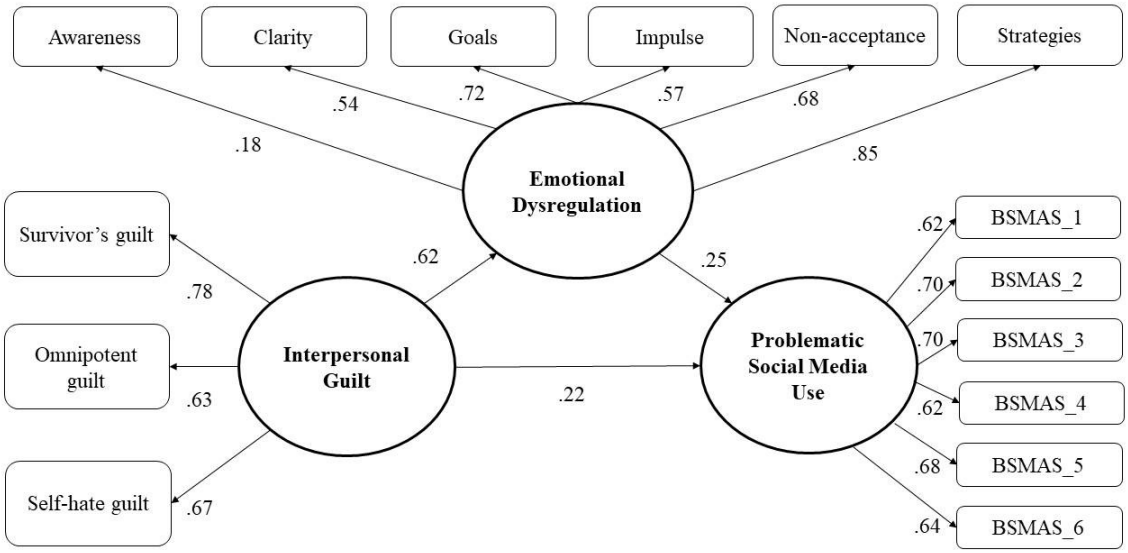



SEM analysis of Model 2 also showed a mediating effect of emotion dysregulation on the relationship between interpersonal guilt and problematic social media use. The model fit data adequately [$\chi2(87)=195.721$, p<.001; RMSEA=.054 (90% CI: .044–.064); SRMR=.068; CFI=.964; TLI = .956]. The mediation model explained 62.1% of emotion dysregulation variance, and 82.3% of problematic social media use variance. The direct effect of interpersonal guilt on

use (β = .25, p < .001). The standardized total effect in the model was .37 (p<.001); the standardized indirect effect of interpersonal guilt on problematic social media use via emotion dysregulation was .15 (p<.001). The standardized estimates of Model 2 are summarized in **figure 2**.

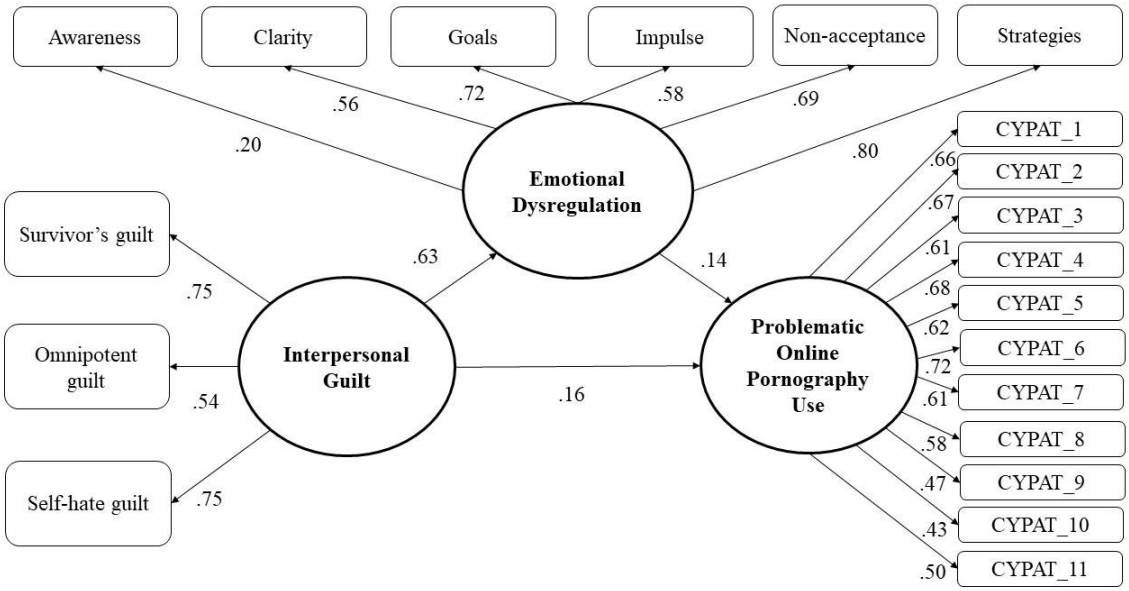
SEM for Model 3 showed that emotion dysregulation mediated the relationship between interpersonal guilt and problematic online pornography use. An adequate

**Figure 2.** *Model depicting the mediating effect of emotion dysregulation on the relationship between interpersonal guilt and problematic social media use*



fit of the model was found [$\chi2(167) = 177.439$, $p = .276$; RMSEA = .012 (90% CI: .00–.025); SRMR = .055; CFI = .996; TLI = .996]. The mediation model explained 60.5% of emotion dysregulation variance and 93.0% of the problematic online pornography use variance. The direct effect of interpersonal guilt on problematic online pornography use was significant ($\beta = .16$, $p = .001$); also, interpersonal guilt was associated with emotion dysregulation ($\beta = .63$, $p < .001$), which in turn was associated with problematic online pornography use ($\beta = .14$, $p = .002$). The standardized total effect in the model was .24 ($p < .001$); the standardized indirect effect of interpersonal guilt on problematic online pornography use via emotion dysregulation was .09 ($p < .001$). The standardized estimates of Model 3 are displayed in **figure 3**.

**Figure 3.** *Model depicting the mediating effect of emotion dysregulation on the relationship between interpersonal guilt and problematic online pornography use*




## Discussion

In the current study, we tested the mediating effects of emotion dysregulation on the relationship between interpersonal guilt and three forms of PIU, namely problematic gaming, problematic social media use, and problematic online pornography use.

Significant sex differences in problematic online behaviors were found. Males showed higher levels of problematic gaming than females, and females showed higher levels of problematic social media use than males, supporting previous meta-analytic findings (Su et al., 2020). Moreover, males suffered from higher levels of problematic online pornography use than females. This result is consistent with previous research suggesting that males spend more time watching pornography (Eljawad et al., 2021; Lewczuk et al., 2021) and show higher levels of problematic pornography use than females (Kumar et al., 2021).

Significant associations emerged from correlation analyses. In accordance with previous studies, we found that younger age was associated with increased levels of problematic gaming (Santoro et al., 2021b; Ünübol et al., 2020) and problematic social media use (Andreassen et al., 2017; Costanzo et al., 2021).

Correlation analyses also showed that interpersonal guilt was positively associated with emotion dysregulation and with the three forms of PIU investigated in the current study. These findings are consistent with evidence showing that feelings of interpersonal guilt are related to inappropriate emotion regulation strategies (e.g., repetitive thinking concerning self-punishment, worry, and rumination; see Gazzillo et al., 2021; Leonardi et al., 2020). Furthermore, several scholars have pointed out that problematic online behaviors might constitute a maladaptive coping strategy to deal with negative emotions and dysregulated affect states (Castro-Calvo et al., 2021; Kardefelt-Winther, 2014; Schimmenti & Caretti, 2017). Therefore, some individuals experiencing high levels of interpersonal guilt might excessively use Internet platforms and services to experience a state of relief from distressing internal experiences.

We also found positive correlations between emotion dysregulation and the three forms of PIU. This finding support previous research suggesting that high levels of emotion dysregulation increase the risk for problematic online behaviors, including excessive videogames (Di Blasi et al., 2019), social media (Liu & Ma, 2019), and online pornography use (Cardoso et al., 2022).

SEM analyses supported our hypotheses. Emotion dysregulation partially mediated the relationships between interpersonal guilt and (H1) problematic gaming, (H2) problematic social media use, and (H3) problematic online pornography use. These findings extend previous knowledge on the affective dynamics involved in PIU. In fact, feelings of interpersonal guilt might increase emotion dysregulation, leading some individuals to seek a retreat into virtual realities, in order to temporarily exclude these unpleasant feelings from consciousness (Schimmenti & Caretti, 2017). In

this respect, it is possible that a problematic use of a given Internet application or service is mainly related to the individual's characteristics and needs, whereas the presence of intense feelings of interpersonal guilt represents for some individuals the common psychological trigger that elicits emotion dysregulation and the subsequent dysfunctional behaviors in the Internet.

Some limitations of the study should be addressed. First, the study involved a sample of voluntary participants from the community, which prevents the generalizability of results to people suffering from functional impairments deriving from PIU. Second, despite we used well-validated self-reported instruments, the use of self-report measures might increase the risk of bias due to response set and social desirability phenomena. Third, the relationships among variables in the current study are invoked based on theory, but the cross-sectional design of the study cannot reveal the causal relationships among variables.

Therefore, longitudinal studies are greatly needed to investigate the direction of the associations between interpersonal guilt, emotion dysregulation, and different forms of PIU. Also, it is advisable that future studies investigate the role of potential risk factors for interpersonal guilt and emotion dysregulation, including childhood trauma and pathogenic beliefs. This might be critical to better refine and specify the theoretical model on problematic online behaviors proposed in this study. For example, the Pathogenic Beliefs Scale (PBS; Aafjes-van Doorn et al., 2021) might be employed to evaluate different pathogenic beliefs – including beliefs underlying interpersonal guilt, the representation of self as undeserving, and the representation of others as unreliable – which could be particularly relevant for understanding how guilt is linked with negative self-representations and might generate emotion dysregulation responses. In addition, future research might involve patients suffering from impairments related to PIU and might employ standardized clinical interviews to improve the generalizability of results. Furthermore, we found in our sample that emotion dysregulation acted as a partial mediator in the relationship between interpersonal guilt and PIU; future studies might investigate the role of other potential mediators that could further explain the relationship between interpersonal guilt and PIU (e.g., biobehavioral and psychological variables, such as serotonin transporter genes, attachment styles, motives concerning Internet use, and so on). Finally, it is advisable that future research investigates the role of interpersonal guilt and emotion dysregulation in the problematic use of specific social media and specific game genres.

## Conclusions

To our knowledge, this is the first study which examined the role of interpersonal guilt in different forms of PIU. Our findings suggest that interpersonal guilt might increase, directly and via emotion dysregulation, the risk for problematic gaming, problematic social media use, and problematic online pornography use. This can have relevant implications for both prevention and treatment of PIU.

It might be critical that preventative actions aimed at reducing PIU risk (for example, prevention programmes in school settings) consider the importance of empowering adaptive emotion regulation strategies, as to avoid vulnerable individuals beginning to use online services and platforms as a "psychic retreat" (Schimmenti & Caretti, 2010) for unpleasant mental states. Similarly, relevant clinical objectives for the treatment of patients suffering from PIU may include an increased ability to recognize, explore, and revise the pathogenic beliefs underlying their feelings of guilt (Gazzillo, 2020), as well as an enhancement of mentalized affectivity (Jurist, 2005), which implies acceptance and recognition of internal states. This might reduce the patients' problematic use of Internet services and applications as a compensatory strategy to cope with guilt-laden and dysregulated emotional states.

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