FACTORS PREDICTING INTERNET GAMING DISORDER: THE ROLE OF CONGRUENT COMMUNICATION

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ABSTRACT

Previous research has highlighted separate associations between adverse childhood experiences (ACEs), family satisfaction, emotion regulation, psychological distress in relation to Internet Gaming Disorder (IGD). However, the role of communication was under-examined. Further, the specific pathways and interactions among relevant variables remain under-explored. This study aims to introduce congruent communication as a new variable and its role in internet gaming disorder and determine its relationship with other salient variables found in earlier studies correlated with IGD. This cross-sectional study recruited 179 Canadian emerging adults (ages 18–29) identified as at risk for IGD who were examined for ACEs, family satisfaction, psychological distress, emotion dysregulation, and congruent communication. Pearson correlation analyses revealed that higher ACE scores were significantly associated with greater emotion dysregulation, psychological distress, congruent communication, and lower family satisfaction. IGD severity (GAS-7) was positively correlated with emotion dysregulation and negatively associated with congruent communication and psychological well-being. Multiple regression analysis showed that the combined model of psychosocial predictors significantly accounted for variance in IGD severity, $R^2 = .094$, $F\ (5, 173) = 3.575$, $p = .004$. However, only congruent communication was a significant predictor of IGD severity, suggesting an interactive effect of variables and the importance of congruent communication in predicting IGD. These findings suggest that while ACEs and emotion dysregulation factors are significantly associated with IGD, their predictive power may operate in complex, overlapping ways with family dissatisfaction, psychological distress, and congruent communication. The result of this study indicates that congruent communication is a potentially significant variable for IGD in addiction counselling.

ETHICS STATEMENTS

Work described in this thesis received research ethics approval from the University of Alberta Research Ethics Board, Project Name “Adverse Childhood Experiences and Internet Gaming Disorder: Role of Congruent Communication”, No. Pro00145684, March 24, 2025.

USE OF GENERATIVE AI

Generative AI tools were used in a limited way in writing this thesis, specifically to assist with language refinement and style adjustment. For language refinement, AI was used to check grammar, correct errors, and improve sentence clarity. For style adjustment, AI helped replace repetitive or informal vocabulary with more formal and academic expressions.

Generative AI did not contribute to the generation of ideas, hypotheses, or the interpretation of findings. The research design, data analysis, interpretation, and literature review are entirely the sole work of the thesis author.

The use of AI tools in this study is comparable to employing grammar-checking software (e.g., Grammarly). This usage is disclosed here in accordance with the policies of the School of Graduate Studies.

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LIST OF ABBREVIATIONS

ACE – Adverse Childhood Experiences
ADHD – Attention Deficit Hyperactivity Disorder
AUD – Alcohol Use Disorder
CBI – Craving Behavioral Intervention
CBT – Cognitive-behavioral Therapy
CCT – Congruent Couple Therapy
DSM – Diagnostic and Statistical Manual
DUD – Drug Use Disorder
ER – Emotion Regulation
GAD – Generalized Anxiety Disorder
GD – Gaming Disorder
IER – Interpersonal Emotion Regulation
IGD – Internet Gaming Disorder
IPV – Intimate Partner Violence
PTSD – Post-Traumatic Stress Disorder

CHAPTER 1. INTRODUCTION

Internet game play has become an increasingly popular activity among adults in the last two decades, giving rise to Internet Gaming Disorder (IGD) as a new public mental health concern world-wide (Feng et al., 2017; APA, 2022). IGD is defined as the persistent and recurrent use of the Internet to engage in games, frequently with other players, resulting in clinically significant impairment or distress (APA, 2013).

IGD as World-Wide Health Issue

The prevalence of IGD varies widely across cultures, with global 12-month prevalence estimated at 4.7% (APA, 2022). However, rates range from as low as 0.7% in Western countries (e.g., the United States, United Kingdom, Canada, and Germany) to as high as 15.6% in Hong Kong (Feng et al., 2017; APA, 2022). Most prevalence studies on IGD have been conducted in Europe and Asia, indicating a pooled prevalence of 10.1% in Southeast Asia and between 1% and 2% in European countries (Chia et al., 2020; Rehbein et al., 2015; Stevens et al., 2021). Although IGD has increasingly been recognized as a global disorder, very few studies have examined or reported its prevalence in Canada, highlighting the need for further IGD-related research in the Canadian context.

According to the national survey conducted by Sanders et al. (2017), around 44% of the whole sample regularly played video games and the average age at which most Canada gamers begin playing digital games is 18.5. Among the 16 genres of games, Facebook/browser games are identified as the most popular formats. Approximately 73.9% of gamers primarily use personal computers, and 71.7% of gamers utilize more than one device to play internet games. Notably, 9.5% of participants reported continued excessive use of internet games, and 14.2% indicated a loss of interest in previous hobbies, except for internet games. There are 3.2% of

adults and 11.9% game players in Canada meeting the diagnostic criteria for IGD. These data indicated that IGD is not a marginal issue but an emerging public health problem in the Canadian context, requiring more targeted research for continued investigation.

According to existing research, IGD is shaped by multiple factors, ranging from individual traits such as reward sensitivity (Li et al., 2020), to broader social dynamics like peer influence (Gunuc, 2017; Schneider et al., 2017), and even media-specific elements such as game design (González-Cabrera et al., 2023; Karhulahti, 2024). To better understand the phenomenon of IGD, it is necessary to first consider its historical background.

Internet Gaming Disorder: Definition and Criteria

IGD is conceptualized according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR; APA, 2022) as a persistent and recurrent gaming behavior that leads to significant impairment or distress in important areas of functioning, such as personal relationships, work, or education. In the DSM-5-TR, IGD is listed under the "Conditions for Further Study" chapter. This means it has not been accepted as a formal diagnostic category, as the manual emphasizes that additional research is required to establish its validity, reliability, and clinical utility.

To meet the proposed diagnostic threshold of DSM-5-TR, an individual must exhibit at least five of the following features within a 12-month period: 1. persistent thoughts about gaming or preoccupation with past gaming experiences or anticipated gaming sessions; 2. emotional distress or irritability when gaming is unavailable or reduced, suggesting withdrawal-like symptoms; 3. escalating time investment, reflected in the need to spend increasing amounts of time gaming to achieve satisfaction (tolerance); 4. repeated unsuccessful efforts to limit or control gaming behavior; 5. loss of interest in other hobbies or activities once enjoyed, replaced

by gaming; 6. continued gaming despite negative consequences in social, occupational, or personal spheres; 7. deceptive behavior, such as lying to family members, therapists, or others about the extent of gaming; 8. using gaming as a coping strategy, specifically to alleviate negative moods, including feelings of guilt, helplessness, or anxiety; 9. jeopardizing significant opportunities or relationships due to excessive gaming.

Although the American Psychiatric Association listed IGD as a proposed condition requiring further research, the World Health Organization formally recognized Gaming Disorder (GD) as a diagnostic category in the International Classification of Diseases, 11th Revision (ICD-11) in 2019 (Hong et al., 2023; World Health Organization, 2019). ICD-11 defined Gaming Disorder (GD) as a persistent or recurrent pattern of digital gaming that is characterized by (1) impaired control over gaming, (2) increased priority given to gaming over other activities, and (3) the continuation of gaming despite the occurrence of negative consequences (World Health Organization, 2019). To be diagnosed in ICD-11, these maladaptive patterns must cause significant distress or impairment in personal, family, social, or educational/occupational functioning for at least twelve months, although a shorter duration is also sufficed under severe symptoms. Compared to DSM-5-TR, which requires a threshold number of symptoms to be diagnosed, the ICD-11 has a narrower but more categorical diagnostic requirements focusing on the above three essential criteria to be present with significant impairment or distress.

Although the ICD-11 has officially recognized GD as a diagnosable condition, the present study will adopt the DSM-5-TR's detailed criteria as its foundation. Previous meta-analysis indicated that majority of existing studies on problematic gaming behaviors employ measurement tools that are based on the DSM-5-TR framework, as most gaming problem scales are conceptually aligned with its proposed criteria for IGD (Pontes & Griffiths, 2015; Petry et al.,

2014). By contrast, the ICD-11 criteria for GD were developed primarily for clinical and public health utility, focusing on functional impairment and clinical boundaries rather than research comparability (Starcevic et al., 2020; Zhou et al., 2024). Given that the present study aims to situate its findings within the broader body of empirical research and to maintain consistency with the most widely used assessment instruments, the DSM-5-TR criteria were adopted as the primary reference point.

Assessment Tools for IGD

To assess Internet Gaming Disorder (IGD), researchers have employed a variety of psychometric instruments. King et al. (2020) conducted a comprehensive review of empirical studies on IGD and identified several commonly used scales. These include the Young Internet Addiction Test (YIAT) and the Young Diagnostic Questionnaire (YDQ), which were originally developed to assess general internet addiction but have frequently been adapted to measure gaming-specific behaviors. Other tools specifically designed to evaluate gaming-related issues include the Compulsive Internet Use Scale (CIUS-14), Petry's IGD criteria, the Game Addiction Scale (GAS) in both 7- and 21-item versions, the Addiction-Engagement Questionnaire (A-EQ), and the Problematic Video Game Playing Scale (PVP Scale). These instruments play a critical role in diagnosing and assessing the severity of IGD. Similarly, Feng et al. (2017) reviewed widely used IGD measurement tools and found that the most frequently applied instruments also included the Chen Internet Addiction Scale (CIAS), and modified DSM-IV criteria for pathological gambling. In addition to these diagnostic tools, numerous theoretical models have been developed to conceptualize the mechanisms and development of IGD.

Cross-Cultural and Gender Invariance of Criteria

While all these criteria contribute to the assessment of IGD, certain symptoms might be different in their predictive strength across cultures. For instance, Rehbein et al. (2015) found that “playing to escape” and “preoccupation” tend to be less robust predictors of IGD severity. Similarly, research in Taiwan has indicated that “deceptive behavior” and gaming as an “escape” show comparatively lower predictive value (Ko et al., 2014). By contrast, across diverse cultural contexts, criteria such as persistence despite negative consequences, neglect of other activities, increased tolerance, and withdrawal symptoms have been consistently identified as stronger indicators of IGD risk (Luo et al., 2022).

These differences on predictive strength were not shown in gender comparisons. Across many datasets, the DSM-5 IGD criteria tend to behave similarly for men and women at the construct level, indicating core criteria are robust irrespective of gender (Pontes et al., 2017; Rehbein et al., 2015; Bottel et al., 2023). But one item-level analysis also showed very small and specific gender-related differences (Wu et al., 2017). Wu et al. (2017) reported slight differences on the “fail to control/cease gaming” item between male and female, indicating that some criteria can be a little bit easier or harder to meet for one group even within the same cultural background. Importantly, this study only reported modest effects and still supported overall gender invariance.

Multidimensional Impacts of IGD

Previous research has highlighted several interrelated domains through which IGD exerts negative influences. Emotionally, individuals with IGD are more likely to experience emotion dysregulation, often relying on gaming as a maladaptive coping strategy for stress and negative affect, which in turn contributes to further psychological difficulties (Lin et al., 2023; Zhao et al., 2024; Schettler et al., 2024). Cognitively, IGD has been associated with impaired executive

functioning, including reduced inhibitory control, heightened impulsivity, and decreased cognitive flexibility (Dong & Potenza, 2014; Chen et al., 2025). These cognitive impairments parallel those found in substance addictions and other behavioral addictions, reflecting the compulsive engagement of gaming with dopamine-related reward networks (Kuss et al., 2018; Weinstein, 2017). At the self-concept level, individuals with IGD often report lower self-esteem, diminished self-efficacy, and reduced life satisfaction, which can both result from and perpetuate excessive gaming behavior (Kavanagh et al., 2023; Bansal & Kranti, 2022). Interpersonally, IGD is linked to social withdrawal, strained family and peer relationships, and greater perceived loneliness, all of which contribute to elevated psychological distress (Wang et al., 2023; Marrero et al., 2021). Physically, prolonged and uncontrolled gaming can lead to health problems such as sedentary lifestyle risks, musculoskeletal issues, and sleep disturbances (Puolitaival et al., 2020; Leung et al., 2024; Bansal & Kadam, 2022; Lam, 2014). Taken together, these wide-ranging consequences underscore IGD as a significant mental and public health concern, warranting further study to better understand its underlying mechanisms.

History of Internet Gaming and IGD

Since the release of the first computer game, *Spacewar*!, in the early 1950s, digital gaming has evolved into a global industry that has profoundly reshaped how individuals spend their leisure time and engage in social interactions (Monnens & Goldberg, 2015; Connolly et al., 2012). Over subsequent decades, digital games gradually supplanted many traditional forms of recreation. As home computers became more affordable in the 1980s and 1990s, concerns regarding excessive and problematic gaming behavior began to emerge (Reer & Quandt, 2021). According to Feng et al. (2017), internet users remained below 10% in most countries in 1995 but rose to over 40% by 2015. As internet usage increased, the prevalence of Internet Gaming

Disorder (IGD) also increased greatly in some countries. Among Korean adolescents, the prevalence rate of IGD increased from 3.5% in 2007 to 5.9% in 2016 (Feng et al., 2017). A 2024 meta-analysis reported the estimated IGD prevalence rate already reached at around 10% among Chinese adolescents (Gou et al., 2024).

During the early stages of research on gaming-related problems, various terms, such as "computer catatonia," "video game addiction," and "pathological gaming", were used to describe maladaptive gaming behaviors (Potenza et al., 2020). These early conceptualizations were primarily informed by diagnostic frameworks originally developed for substance use disorders and pathological gambling, as reflected in adaptations of DSM-III and DSM-IV criteria (Griffiths & Pontes, 2020). However, as Charlton (2002) observed, early assessment tools often failed to distinguish between pathological addiction and non-problematic high engagement, resulting in potential overestimation of prevalence rates. By the late 1980s, cognitive-behavioral therapy (CBT) began to emerge as a promising treatment for problematic gaming (Keepers, 1990). In the 1990s, scholarly attention increasingly focused on the potential negative impacts of gaming, particularly on children within educational settings. Despite growing academic and clinical interest, a formal diagnostic category did not appear until 2012, when the DSM-5 Task Force and Work Group introduced the term *Internet Gaming Disorder* (IGD), designating it as a condition warranting further clinical research (King & Delfabbro, 2018).

In parallel, the World Health Organization later adopted the term *Gaming Disorder* (GD) in the ICD-11 (Zhou et al., 2024). Although related, IGD and GD are not interchangeable terms. Tuncturk et al. (2023) reported only a 73% overlap in their diagnostic criteria, highlighting key conceptual and clinical differences. GD is defined as a persistent pattern of gaming behavior characterized by impaired control over gaming, increased priority given to gaming over daily

activities, and continuation of gaming despite negative consequences (Zhou et al., 2024). In contrast, IGD places greater emphasis on excessive and compulsive engagement, accompanied by significant impairments in physical health, social functioning, and daily life activities (APA, 2013; Zhou et al., 2024). For the purposes of this study, the term "Internet Gaming Disorder" (IGD) will be used, consistent with the conceptualization outlined in the DSM-5.

Comparing IGD to Other Addictions

Similar to other behavioral addictions (e.g., gambling, compulsive sexual behavior, compulsive buying), IGD is conceptualized as an addictive behavior without exogenous substances, but with overlapping psychological and neurobiological mechanisms (Alavi et al., 2012; WHO, 2019). Incentive-sensitization theory distinguishes "wanting" from "liking," implicating dopaminergic systems in cue-triggered craving across addictions; this framework has been applied to gaming as well (Robinson & Berridge, 1993; Berridge & Kringelbach, 2015; Berridge & Robinson, 2016).

Moreover, there is also neuroscientific evidence supporting the similarity between IGD and other addiction disorders. Neuroimaging work links gaming cues to activation in reward, salience, and executive control circuits (e.g., right insula, dlPFC, orbitofrontal cortex), consistent with attention bias and altered decision-making in IGD (Kuss & Griffiths, 2012). At the same time, IGD differs from substance addictions in lacking direct chemical neurotoxicity and in typically showing psychiatric/psychosocial impairment rather than organ damage; treatment studies report meaningful improvements in quality of life and executive functions over months (Lim et al., 2016; Young & Rogers, 1998).

Relative to other behavioral and substance addictions, IGD prevalence appears higher than problem gambling in many high-income countries and comparable to some drug use

disorders, while remaining well below alcohol use disorder (AUD) (Stevens et al., 2021). Canadian surveillance from 2012 reported the alcohol dependence at 3.2%, cannabis dependence at 1.3%, and other drug dependence at 0.7% (Statistics Canada, 2015). Compared to these addictions, a later study reported the prevalence rate of IGD to be 3.2% among adults (Sanders et al., 2017). Taken together, these data indicate that while IGD's point prevalence is usually lower than AUD, it is comparable to drug use disorder (DUD) and substance use disorders, indicating a pattern consistent with IGD's emergence as a new, clinically significant addiction as result of digital access and gaming ecosystems (Kim et al., 2022; Stevens et al., 2021).

Research Purpose

The purpose of this study is to integrate a range of variables that have previously been examined independently in research on IGD. While ACEs, emotion dysregulation, family satisfaction, and psychological distress have each been linked to IGD, few studies have investigated how these variables interact as part of an interconnected system. This study also introduces congruent communication as an exploratory construct in relation to IGD, as its influence on IGD has not been examined to date. Although these variables have been studied individually in previous studies, the present study seeks to investigate their inter-correlations and explore their combined influence and potential interactions within a single, integrative model. In doing so, this study aims to clarify the associations among ACEs, emotion dysregulation, family relationships, psychological distress, and congruent communication with respect to IGD severity, while also examining the role of congruent communication as a new construct in IGD. The theoretical background and rationale for selecting these variables will be introduced in Chapter Two.

CHAPTER 2. LITERATURE REVIEW

Associated Features and Consequences of IGD

IGD is characterized by excessive and uncontrolled gaming that leads to significant psychological distress and impairment in daily functioning (Chen et al., 2025). A prominent feature of IGD is emotion dysregulation, found among individuals with IGD who often struggle to manage their emotions and experience intense negative affect or mood swings. Lin et al. (2023) have found that difficulties in emotion regulation are closely correlated with the severity of IGD symptoms. In fact, longitudinal study has also indicated that poor emotion-regulation abilities can predict increases in problematic gaming over time (Schettler et al., 2024). This suggests that many excessive gamers tend to rely on gaming as a maladaptive coping strategy for stress or negative feelings, which in turn only reinforces further emotion dysregulation and psychological distress.

Another main impact of IGD involves cognitive control deficits. Individuals with IGD consistently exhibit impairments in executive functions, including weakened inhibitory control, attention regulation, and decision-making, which are similar to patterns seen in substance-related addictions (Chen et al., 2025). Reduced executive control over gaming urges is considered a central feature of IGD, helping to explain the reason that individuals with IGD symptoms tend to continually play games despite being aware of negative consequences (Dong & Potenza, 2014; Chen et al., 2025). Research has also documented that IGD is associated with elevated impulsivity and poorer cognitive flexibility, and neuroimaging studies reveal abnormalities in prefrontal and anterior cingulate brain regions responsible for self-regulation (Zhao et al., 2024). These cognitive control deficits contribute to the compulsive nature of disordered gaming, making it difficult for individuals to limit their screen time and resist gaming “cravings.” Over

time, the dysfunctioning of self-control mechanisms in IGD perpetuates a cycle in which gamers feel unable to stop playing even as they recognize negative consequences IGD caused.

Moreover, IGD also negatively influences self-concept and interpersonal functioning, such as individuals who suffer from IGD tend to report significantly lower self-esteem compared to non-IGD peers (Kavanagh et al., 2023). A recent meta-analysis confirmed a moderate inverse correlation between self-esteem and gaming disorder severity, indicating that those with more severe IGD symptoms often have poorer self-worth (Kavanagh et al., 2023). Consistent with these findings, one clinical study has observed that people with IGD frequently exhibit low self-esteem, low self-efficacy, and reduced life satisfaction (Bansal & Kranti, 2022). This diminished self-concept may both result from and contribute to excessive gaming, as individuals with reduced self-esteem might retreat into games for a sense of achievement or escape from real-world failures.

At the interpersonal level, IGD can lead to social withdrawal and conflicts in relationships. Excessive gamers often neglect family, friends, and social obligations, which can strain interpersonal relationships and foster loneliness (Wang et al., 2023). For example, adolescents with heavy gaming involvement commonly experience interpersonal difficulties, such as arguments with parents or peers over game use and reduced engagement in offline social activities (e.g. poor school performance, interpersonal relationship difficulties, aggressive behavior, and depression). These social impairments further exacerbate psychological distress, creating a vicious cycle whereby isolation and low self-esteem drive more engagement in the virtual gaming world at the expense of real-life connections (Wang et al., 2023; Marrero et al., 2021).

In addition to mental health consequences, IGD is also linked to a range of physical health problems. By its nature, compulsive gaming promotes a sedentary lifestyle with greatly reduced physical activity. Epidemiological research confirms that heavy gamers tend to have poorer fitness and higher rates of overweight or obesity than their peers, reporting adolescents who play video games excessively show greater body fat and spend significantly more hours sitting, with correspondingly lower levels of vigorous physical activity (Puolitaival et al., 2020). Poor posture and repetitive strain are additional concerns on maintaining a fixed seating position for long gaming sessions, which often leads to musculoskeletal issues. Over half of frequent gamers report physical symptoms such as back or neck pain and hand or wrist pain from prolonged gaming sessions (Leung et al., 2024). Sleep disturbances are another well-documented consequence of IGD. Individuals with IGD are more likely to sacrifice sleep to continue gaming late into the night, leading to chronic sleep deprivation and disrupted circadian rhythms (Bansal & Kranti, 2022). And IGD has also been found to be associated with poor sleep quality and insomnia, and excessive gamers often experience significantly shortened sleep duration and irregular sleep–wake schedules (Bansal & Kranti, 2022; Lam, 2014). In summary, the sedentary behavior, sleep disruption, and ergonomic stresses associated with IGD can significantly decrease an individual's physical well-being.

Individual Risk Factors of IGD

Some studies have indicated how various behavioral, cognitive, individual and social interaction factors may be correlated with the development of IGD.

A study in Korea has indicated that IGD can be predicted by behavioral factors, including money spent on gaming, weekday game time, offline game club attendance, and game club membership status (Rho et al., 2018). This study also identified psychological risk factors related

to IGD, such as impulsivity, self-control, and other co-occurring addiction disorders. Another study has also indicated that individuals with IGD are more likely to report less frequent physical exercise and reduced social time with others, leading to a significant decrease in both physical activity and social activity (Przybylski et al., 2017). Although these studies do not establish a cause-and-effect relationship, they still offer valuable insight into how individual behaviors correlate with IGD.

At the individual level, sex differences were found in the development of IGD. Male adolescents are more likely to use online networks for playing games, while females typically use them for communication and information sharing (Gross, 2004; Hyun et al., 2015). Furthermore, higher levels of novelty-seeking, the comorbidity of ADHD, and increased impulsivity in male also contribute to these sex differences in IGD risk (Hyun et al., 2015).

King and Delfabbro (2014) identified four cognitive factors correlated with Internet Gaming Disorder (IGD): (1) beliefs about game rewards, (2) maladaptive and inflexible rules about gaming behavior, (3) gaming-based self-esteem, and (4) using gaming as a method of gaining social acceptance. The first factor involves the overvaluation of gaming items, where virtual rewards are perceived as tangible and more important than other life activities, including an emotional attachment to one's virtual avatar and online identity. The second factor primarily involves justifications for continued gaming engagement, such as sunk cost bias towards effort already invested, internal pressure to complete in-game tasks, or maladaptive rules governing game duration and plans. The third factor includes an over-reliance on gaming to fulfill self-esteem needs, stemming from negative core beliefs about oneself in real life. Individuals motivated by this factor often feel a sense of worthlessness and vulnerability offline, believing that positive feelings can only be found online, feeling more powerful in the game than in real

life, and viewing gaming as method to feel accomplished. The last factor typically involves a preference for online social interactions, lower social competence in the real world, avoidance of relationships and responsibilities, and a reliance on the sense of acceptance and belonging provided by the gaming community.

Psychopathological Factors for IGD

González-Bueso et al. (2018) identified several psychopathological factors as significant risk factors for IGD, including high levels of impulsivity, difficulties in controlling gaming behavior, anxiety, depression, and social phobia. These following factors inspired us to considering self-regulation ability and psychological distress as important variables.

Attention deficit hyperactivity disorder (ADHD) is one of the most correlated disorders with IGD and other addiction disorders. According to a meta-analysis study of Koncz et al. (2023), a significant medium-sized correlation was found between ADHD scores and the severity of IGD. Furthermore, they indicated individuals with pathological gaming behaviors are 13 times more likely to be diagnosed with ADHD compared to those without gaming addiction. Even a specific prospective study suggested that pathological gaming behavior might primarily be a symptom of underlying ADHD, rather than an isolated disorder (Ferguson & Ceranoglu, 2014). Their hypothesis is supported by path analysis result suggesting that pathological gaming often stems from attention problems, rather than the inverse. Wartberg et al. (2019) have indicated only pre-existing ADHD symptoms can predict subsequent pathological gaming behavior. According to Lee et al. (2021), patients with both ADHD and IGD also reported worse prognosis and recovery compared to these patients with only IGD.

Major Depressive Disorder (MDD) According to Liu et al. (2018), there is a bidirectional relationship between IGD and depression severity, indicating that each may influence the other.

Following the application of craving behavioral intervention (CBI) to IGD patients, MRI data showed decreased connectivity between the left amygdala and the left middle frontal and precentral gyrus. They suggest that both IGD and depressive symptoms may be closely linked through neural mechanisms. Another study by Wichstrøm et al. (2019) also reported a weak correlation between the number of present IGD-symptoms and major depressive disorder.

Generalized anxiety disorder (GAD) has also been found to be associated with IGD, as comorbid GAD often contributes to heightened emotional difficulties and greater challenges in behavioral inhibition (Wang et al., 2017). Anxiety symptoms have been associated with a poorer prognosis for comorbid disorders, including higher suicidality and greater treatment resistance (Wang et al., 2018). Moreover, there are more mental disorder symptoms correlated with IGD. Compared to a healthy control group with no IGD risk, individuals exhibiting IGD symptoms scored significantly higher on scales measuring somatization, obsession-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism, and impulsiveness (Kim et al., 2016)

Family-related Influences on IGD

Family-related factors, which are central to the ecological systems individuals live within during early life, are also important to consider when we are studying IGD (Darling, 2007). Adolescents exposed to extreme or damaging parenting, including parental psychological control, abuse, neglect, and parental rejection were facing a higher risk of developing negative psychological outcomes and IGD (Pawłowska et al., 2018; Sugaya et al., 2019; Xie et al., 2021). Furthermore, adolescents' problematic or low-quality of relationships with parents were identified as significant risk factors for IGD (Mohamed et al., 2023). A longitudinal study highlighted that the parental feeling of loneliness is positively and significantly correlates with

children's loneliness and online gaming addiction (Mun & Lee, 2022). Joint effects of children's emotional problems and parental depressive symptoms also influence the incidence and risk of IGD (Jeong et al., 2021). All suggesting complex family dynamics underlying IGD mechanisms, while children's beliefs about being responsible for their parents were significantly linked to IGD (Pawlowska et al., 2018).

Similarly, Kim and Kim (2015) reported that higher quality parent-child attachment and adolescents' attitudes toward parenting are protective factors against IGD. Besides the relationship between child and parents, parental marital conflict also positively predicts IGD, mediated by factors like self-esteem, peer affiliation, and teacher-student relationship (Wang et al., 2023; Jeong et al., 2020; Teng et al., 2020).

Family discipline and rules are also important predictors of IGD, such as non-supervision, non-discipline, physical punishment, and severe physical punishment all strongly and positively associated with IGD (Cuong et al., 2021). Harsh fathering negatively predicts male's psychological need satisfaction and IGD, but does not affect females similarly (Wang et al., 2024). Interestingly, IGD is also significantly predicted by maternal employment and higher maternal education, suggesting different parental roles in adolescent IGD development (Karaca et al., 2020). Lastly, adolescents with IGD are more likely to perceive their parents as less caring and less concerned about their autonomy, highlighting that perceived acceptance and psychological autonomy as important risk factors (Bulanik Koc et al., 2020).

Adverse Childhood Experiences

Adverse childhood experiences are potentially traumatic events that can have negative influences on an individual's long-term well-being (Boullier & Blair, 2018). According to Felitti et al. (1998), the categories of ACEs include psychological, physical, or sexual abuse, violence

within household members, and living with household members who are substance abusers, mentally disordered, suicidal, or imprisoned. In a Canadian survey study, 61.6% of participants reported exposure to at least one ACE, with 35.6% reporting exposure to two or more ACEs (Joshi et al., 2021). Moreover, ACEs have been found to significantly predict poor communication quality, which negatively impacts family-related life quality and increases the risk of behavioral addiction (Baller & Lewis, 2022). Exposure to ACEs is identified as a risk factor with the capacity to predict gaming frequency and symptoms of IGD, albeit with a weak predictive power (Richard et al., 2023). Nevertheless, ACEs have been strongly associated with an individual's ability to manage emotions, psychological distress, communication congruence, and poor family relationships, all recognized as risk factors for IGD (Baller & Lewis, 2022; Boullier & Blair, 2018; Felitti et al., 1998; Joshi et al., 2021).

According to Poole et al. (2018), ACEs are positively correlated with difficulties that individuals encounter in emotion regulation and interpersonal communication. Furthermore, emotion dysregulation is often considered to mediate the correlation between ACEs and various mental disorders (Cloitre et al., 2019). The study by Lim et al. (2020) supports the idea that emotion dysregulation mediates the impact of childhood adversity on the severity of behavioral addiction. In addition to the correlation with emotion dysregulation, ACEs have been found to be associated with current mental health. A longitudinal survey discovered that ACEs can significantly predict individuals' drug use, antisocial behavior, and depression among young adults (Schilling et al., 2007). Another study indicates that individuals with more ACEs tend to have significantly higher levels of psychological distress, as measured by the ten-item Kessler Psychological Distress Scale (K10; Agbaje et al., 2021). Importantly, psychological distress has

also been found to mediate the impact of ACEs on individuals' present addictive behaviors, such as alcohol use (Strine et al., 2012).

ACEs have also been correlated with poor family relationships, manifested as decreased family cohesion and increased family conflicts. According to Wang et al. (2021), child maltreatment significantly predicts lower levels of parental warmth, reduced father involvement, and fewer structural advantages within family in later life. In other words, individuals with ACEs are more likely to experience reduced parental warmth, impaired family functioning, and weaker connections between family members. Moreover, a history of ACEs has also been found to predict greater relationship distress and lower relationship satisfaction in adulthood (Khalifian et al., 2022). In other words, experiencing ACEs can lead to relationship distress, considered a mediator between ACEs and mental health consequences (Wheeler et al., 2019). Previous studies have shown that the severity of internet addiction is closely related to less family cohesion and poor family communication quality (Sarour & El Keshky, 2023; Tajalli & Zarnaghash, 2017). This evidence emphasized the long-term consequences of ACEs endured by individuals on family relationships and broader addictive outcomes.

Impacts of ACE on Mental Well-being

Individuals who experienced adverse childhood events often report higher psychological distress in adulthood, but this negative outcome is frequently mediated by emotion regulation (Cloitre et al., 2019; Cameron et al., 2018). Among individuals with low ACE scores, their adult psychological distress is typically mediated by four types of emotion regulation difficulties: nonacceptance of emotional responses, difficulty engaging in goal-directed behavior, impulse control difficulties, and limited access to emotion regulation strategies (Rudenstine et al., 2019). Emotion regulation is considered an important mediator that influences the relationship between

ACEs and well-being. According to Cloitre et al. (2019), improved emotion regulation can effectively reduce symptoms of PTSD and depression, and enhance physical health in individuals with ACEs. Another study, which applies an emotion regulation perspective to interventions for adults with high ACEs, supports these findings. It has shown increased psychological resilience, mental well-being, and quality of life (Cameron et al., 2018). However, a specific study has indicated that the mediating effect of emotion regulation exists only for individuals with fewer ACEs and does not influence the psychological outcomes of those with high ACEs (Rudenstine et al., 2019). Besides these findings, Brodbeck et al. (2022) presented an integrated model of emotion regulation and social information processing in response to ACEs. Their study indicates that individuals with ACEs often exhibit altered social information processing, characterized by heightened sensitivity to rejection and biases in interpreting social cues, leading to challenges in social interactions and relationships. Furthermore, ACEs influence emotion regulation, resulting in increased emotional reactivity and decreased efficacy in managing emotions, contributing to further psychological distress and difficulties in handling social situations. For detailed influences of ACE on emotion regulation, males, non-heterosexual individuals, and those who reported parental over-control are more likely to use suppression (McLafferty et al., 2020). This is considered a maladaptive strategy that does not help in reducing psychological problems, self-harm, or suicidal behavior among adolescents. Without effective emotion regulation, early life adversity can lead to greater perceived stress and significantly reduced cognitive flexibility in adulthood (Kalia & Knauft, 2020). The negative impacts of ACEs can also persist for the whole life span, even older adults with ACEs have reported significantly worse sleep quality and more severe sleep impairment (Sheffler et al., 2023).

ACE and Family Relationship

Since ACEs often occur within the family environment, disrupted and disturbed parent-child relationships are central to the issue. According to Shonkoff et al. (2012), these damaged relationships and experiences are frequently passed down to the next generation through similar caregiving patterns. The reactions and outcomes of adolescents to ACEs are also greatly influenced by family functioning, which refers to the dynamic method by which family members interact, maintain relationships, solve problems, communicate, and care for each other (Scully et al., 2020). Both ACEs and family functioning were predictors of each other and can be influenced by parental mental health issues such as depression, antisocial behavior, PTSD, and general psychological distress. Overall, a higher frequency of ACEs is associated with poorer family functioning and more challenges within the family. A significant but relatively weak correlation has also been found between ACEs and marital satisfaction in later romantic relationships (Lorenzo et al., 2024). This type of altered relationship between ACEs and marital satisfaction is considered to be influenced by the attachment styles formed as a result of ACEs. According to Banks (2023), individuals with higher levels of ACEs more frequently have higher levels of anxious attachment, which subsequently leads to lower levels of relationship functioning. Moreover, Banks' model suggests that attachment styles influenced by ACEs will subsequently affect the types of relationships individuals seek, both romantically and platonically. This suggestion is supported by Khanna and Kumari (2024), who found that anxiety attachment styles, caused by ACEs, were negatively and significantly correlated with romantic satisfaction.

The influence of early life trauma, such as ACEs, can have a deleterious effect not only on individuals across their life course but also on their adult couple relationships (Anderson et

al., 2020). Trauma experienced by one partner can negatively influence relationship support, communication, boundaries, and other dynamics. The detrimental effects of ACEs on relationships can extend beyond the couple, making it difficult to form and sustain interpersonal relationships in general. Individuals with a history of ACEs often report lower levels of trust and greater emotion dysregulation in relationships.

Moreover, the impact of ACEs on relationships can also influence intimate relationships instead of only inter-generational relationships. Previous research on couples has shown that ACEs may be important for assortative mating, a tendency for mated pairs to be more phenotypically similar for a given characteristic than would be expected by chance (Andersson et al., 2021). If one partner had experienced childhood adversity, it was more likely that the other had as well. And when both members of a couple have experienced multiple ACEs, they are at a much greater risk of poor health outcomes, including higher levels of anxiety, depression, and stress. Moreover, the negative consequences caused by ACEs are also significant in intimate relationships. ACEs can also lead to increased stress in adulthood, which may in turn lead to intimate partner violence (IPV) in relationships (Hammett et al., 2020). A study of newlywed couples found that for husbands, the link between early adverse experiences and violence was explained by their current stress levels. This suggests that for men, early life trauma shapes how they respond to stress in close relationships, which can then increase the likelihood of violence. Relationship quality has also been identified as a key factor mediating the link between ACEs and health outcomes (Wheeler et al., 2020). Wheeler et al. (2020) found that for both men and women, ACEs affected health primarily through their impact on relationship quality, suggesting that better relationships can help reduce the negative health effects of early adversity. In

summary, the association between ACEs and current family or couple relationship quality is clearly supported in previous studies.

Congruent Communication

Congruent Communication refers to the interaction in which an individual's verbal messages and nonverbal languages are fully aligned with internal feelings (Lee, 2009; Rasheed et al., 2011). According to Ginott (1972), it is a communication style that is "harmonious, authentic; where words fit feelings". In the early history in the field of family therapy, communication patterns are already considered as important factors of psychological well-being (Metcalf, 2023).

The relationship between ACEs and poor communication quality has been observed clinically, showing significant links to both substance and behavioral addictions (Lee, Ofori et al., 2022). Congruence Couple Therapy (CCT) offers a therapeutic model that helps to understand how ACEs, as a form of intergenerational trauma, contribute to impaired development of congruent communication (Lee & Merali, 2022). From the perspective of CCT, behavioral addiction is viewed as merely the tip of the iceberg, with the underlying issues rooted deeply within the family system (Lee, 2009). Communication, which encompasses how individuals interact with others and engage with the world, is recognized as a visible and measurable aspect of relationship that is informed by underlying systems. These underlying systems include the intrapsychic operations of feelings, beliefs, expectations and the universal-spiritual human need for connection, safety and worth and the individual's childhood experiences (Lee, 2017). In other words, congruent communication is considered a critical bridge linking ACEs to behavioral addiction and emotion regulation (Bastardo Gaelzer, 2019; Lee et al., 2023).

Within this CCT framework, congruent communication occurs when communication patterner speak authentically about themselves, making room to receive one another without

distortion, and remain mindful of contextual influences (Lee, 2009; Lee & Isik, 2025). When this triadic alignment among Self, Other, and Context is disrupted, couples exhibit one of five incongruent communication postures: superior, inferior, enmeshed, fixing, or avoidant (Lee, 2017). Building upon this theoretical foundation, Lee and Isik recently developed the Congruent Communication Scale (CCS) to empirically measure these communication postures (Lee & Isik, 2025). In the present study, the CCS will be employed to examine participants' congruent communication pattern, allowing for the exploration of how communication styles relate to variables of ACEs, emotion dysregulation, psychological distress, family relationship dissatisfaction, and IGD severity.

Moreover, family communication, including support and communication, are associated with positive adolescent development and can act as protective factors against emotional and behavioral problems (Lackova Rebicova et al., 2020). Difficult communication with both parents is related to emotional and behavioral problems in adolescents, but the effect of ACEs combined with communication problems is multiplicative, with a stronger effect found for communication with the mother (Lackova Rebicova et al., 2020). A large sample sized study on over 5,000 Slovak adolescents found that high quality communication with fathers helped reduce the negative effects of ACEs, suggesting that it can act as a protective factor. Furthermore, affectionate communication has been found to act as a "stress-buffering" mechanism, moderating the association between ACEs, depressive symptoms, and stress in adults (Floyd, 2024).

Emotion Regulation as Key Variable

Emotion regulation (ER) is a multidimensional construct encompassing the ability to effectively monitor, evaluate, and modulate emotional responses. It involves appraising and controlling the intensity, duration, and valence of emotions across various contexts (Gratz &

Roemer, 2008; Gross, 1998; Naragon-Gainey et al., 2017). This includes both the expressive and behavioral responses to a given stimulus (Gratz & Roemer, 2008). Maladaptive emotion regulation, on the other hand, can become habitual over time and lead to a feedback loop of increased distress. Examples of maladaptive strategies include avoidance, emotional suppression, and self-destructive behaviors (Bonanno & Burton, 2013; Runtz & Schallow, 1997).

Emotion regulation is identified as an important mechanism that mediates the relationship between childhood adversity and a wide range of negative outcomes in adulthood. Multiple studies confirm the mediating role of emotion regulation in the association between childhood adversity and psychopathology (Cloitre et al., 2019; Miu et al., 2022). Specifically, difficulties with emotion regulation can help explain the link between ACEs and adult psychological distress (Rudenstine et al., 2019), as well as PTSD, depression, and poor physical health (Cloitre et al., 2019). The use of maladaptive strategies like rumination and suppression is linked to worse mental health, while the use of adaptive strategies such as reappraisal is associated with better mental health (Miu et al., 2022). Beyond psychopathology, emotion regulation also influences coping and addiction. Individuals with more ACEs are more likely to use avoidant, emotion-focused coping strategies, which partially explains why they experience worse long-term health outcomes (Sheffler et al., 2019).

Emotion regulation is also significantly influenced by childhood adversity, particularly by experiences of maltreatment. Adversity, especially when caused by caregivers, compromises an individual's capacity for emotion regulation, leading to increased emotional lability, negativity, and aggressive behavior in maltreated children (Shields & Cicchetti, 1998). The meta-analysis conducted by Miu et al. (2022) confirmed that people who experienced childhood adversity are more likely to have general difficulties regulating emotions and to use maladaptive strategies

such as rumination and suppression. From a developmental perspective, emotion regulation emerges from abilities like attention and memory, which are themselves vulnerable to the impact of childhood adversity (Ruba & Pollak, 2020).

Furthermore, the number of ACEs can also influence the relationship between emotion regulation and psychological distress. For individuals with low ACE scores, emotion regulation problems like nonacceptance of emotions and impulse control difficulties are significant in explaining adult distress. However, for those with high ACE scores, these emotional problems do not play as strong a role, suggesting that other factors become more influential when the trauma is severe (Rudenstine et al., 2019).

Interpersonal Emotion Regulation

The concept of Interpersonal emotion regulation (IER) will help better understand how emotion regulation is correlated with relationship quality, communication patterns, and ACEs. IER is a relatively new concept in emotion regulation theory that has gained increasing attention in recent research (Gökdağ, 2021). While intrapersonal emotion regulation focuses on how an individual manages their own emotions, IER describes how individuals use their social interactions and relationships to influence their own or others' emotions (Christensen & Haynos, 2020). It involves a wide array of strategies aimed at regulating another person's emotions, as well as an individual's tendency to use others to get a sense of safety or reduce distress (Altan-Atalay & Saritas-Atalar, 2022; Gökdağ, 2021). IER is also an important concept for understanding how individuals navigate and cope with emotional distress, especially in the context of close relationships. It provides a lens to explore social and emotional constructs related to mental health and can offer potential targets for prevention and intervention in difficult-to-treat disorders (Christensen & Haynos, 2020). This concept highlights the important

role of social support and relationships in emotional well-being and acknowledges that emotion regulation is not solely an internal, individual process but a dynamic, relational function (Nozaki & Gross, 2025). Moreover, IER also has a complex relationship with mental health such as perceived social support, which is closely related to IER and is a protective factor against depression (Christ et al., 2019; Gökdağ, 2021). However, excessive dependence on IER strategies, such as reassurance-seeking, might be linked to increased psychological distress because of the potential disruption of a person's own capacity to deal with difficult emotions (Altan-Atalay & Saritas-Atalar, 2022).

A history of childhood maltreatment is a strong predictor of lifelong emotional and psychological difficulties (Niedtfeld et al., 2025). The study of Niedfeld et al. (2025) indicates that childhood maltreatment is associated with impairments in both intrapersonal and interpersonal emotion regulation. And they found that higher levels of childhood maltreatment were associated with a reduced use of IER strategies, such as seeking reassurance or venting. They proclaimed reduced reliance on social support may be an adaptive response in environments where caregivers were insensitive, unpredictable, or untrustworthy. The effect of childhood emotional abuse, specifically, on depressive symptoms is mediated by emotion dysregulation and interpersonal problems (Christ et al., 2019). Children who experienced emotional abuse by attachment figures may develop negative internal working models of themselves and others, which can lead to interpersonal avoidance and a lack of trust (Christ et al., 2019). Overall, childhood experience is playing a significant role in the development of IER.

IER and Congruent Communication

On the other hand, IER is also found to be closely linked to the quality of relationships and communication patterns, since emotion regulation and interpersonal communication are

positively correlated with each other (Aqib & Rizwi, 2020). An individual's attachment style, which is formed in childhood, affects both intrapersonal and interpersonal emotion regulation (Mikulincer & Shaver, 2016; Mikulincer et al., 2003). Anxious attachment is positively associated with IER strategies, with the strongest correlation found with the soothing strategy (Gökdağ, 2021; Koc et al., 2019). This suggests that individuals with an anxious attachment style may be more likely to seek sympathy and comfort from others to deal with negative emotions (Gökdağ, 2021). Conversely, individuals with avoidant attachment tend to suppress their emotions and distance themselves from others (Mikulincer & Shaver, 2003). Beside the correlation with relationships, supportive communication is found to be a key aspect of IER (Nozaki & Gross, 2025). The need to be soothed while regulating negative emotions can push people to seek social support, which can protect them from psychological distress (Gökdağ, 2021). The documents also define interpersonal emotion dynamics as the ways in which emotions and self-regulation are dynamically influenced by partners, given their interdependence (Sels et al., 2021). This highlights the importance of interdependence and perceived partner responsiveness in the emotional interactions within intimate relationships.

Theoretical Models for IGD

A number of models have been proposed for the development of IGD with the most prominent ones discussed below.

Dual Process Model

The dual process model offers a neurological framework for understanding internet-related addictions, positing that such addictions arise from lapses in self-control due to conflicts between automatic and deliberative modes of behavioral control (Tan et al., 2024; McClure & Bickel, 2014). According to this model, the mesolimbic dopamine pathway, which is central to

automatic processing and reward circuitry, responds to stimuli that potentiate addictive behaviors. Conversely, the lateral prefrontal cortex is tasked with deliberative processing, playing a crucial role in self-control and the inhibition of impulsive behaviors (McClure & Bickel, 2014). The model suggests that a weakness in resisting immediate temptations in favor of long-term rewards is a primary factor in addiction. Supporting this, research has shown that deficiencies in self-regulation are significant predictors of greater susceptibility to behavioral addiction. These deficiencies not only increase vulnerability but also facilitate the transition from isolated behaviors to full-blown behavioral dependence (Lannoy et al., 2014; Evans & Coventry, 2006; Tan et al., 2024).

Cognitive Behavioral Model for Addiction

The cognitive-behavioral model elucidates the symptoms of IGD through the lens of cognitive distortions and reinforced maladaptive behaviors (Dong & Potenza, 2014). This model posits that IGD develops from distorted beliefs regarding the benefits of gaming, for instance, viewing gaming as a reliable method to escape psychological distress or to forge connections with peers (Şenormancı et al., 2012). Such cognitive distortions foster unrealistic expectations about the outcomes of gaming, thereby increasing the likelihood of excessive engagement. On the behavioral side, gaming activities are often reinforced with positive outcomes, such as immediate pleasure from stimuli and the avoidance of unpleasant realities. Consequently, the model suggests that the development of IGD is not only a personal struggle but is also influenced by broader relational dynamics. Factors such as family dissatisfaction and ACEs may predispose individuals to use gaming as a coping mechanism, facilitating the onset and perpetuation of IGD (Dong & Potenza, 2014).

Congruence Couple Therapy (CCT)

CCT was originally developed as a relational framework and intervention for gambling disorder and later extended to alcohol use disorder (Lee, 2015; Lee et al., 2023). CCT posits that addictive behaviors are driven by incongruence and lack of awareness and alignment of four interrelated human dimensions: intergenerational, interpersonal, intra-psychic, and universal-spiritual (Lee, 2009). Within CCT, addiction is viewed as an extreme form of alienation and disconnection from these dimensions, and recovery involves integrating these disconnected sections into a unified whole (Lee, 2009).

Interpersonal Level. At the interpersonal level, communication is essential for navigating the world and building relationships. The types of communication an individual uses are significantly shaped by early life experiences, which influence how individuals interact and form connections (Lee, 2017). Moreover, communication also serves as an important tool for coping with internal stress, expanding perspectives, and developing solutions to life's challenges. A dysfunctional communication style learned in early life can impair an individual's ability to receive social support, be aware of their feelings, and to open to Self and Other. Lee and Merali (2022) have noted that an increase in congruent communication is strongly correlated with a decrease in addictive behaviors. This correlation exists because many individuals with addictions tend to have avoidant communication, indicating a low degree of congruence. In summary, congruent communication is expected to be significantly correlated with both past and present addiction experiences.

Intra-Psychic Level. Intra-psychic factors encompass our feelings, feelings about feelings, perceptions, expectations, and beliefs about ourselves in various contexts (Lee, 2017). These intrapsychic experiences can arise from one’s present interactions, the existing context, as well as past experiences.

Universal-Spiritual Level. Universal-spiritual factors encompass the fundamental yearnings and aspirations common to all humans, which revolve around the needs for connection, safety, and worth (Lee, 2017). These include the desires for a sense of belonging, to feel loved and to love, to be accepted and respected (Lee & Merali, 2022). When these universal-spiritual human needs of connection, safety and worth are not met, a person could resort to avoidance of human relationships or seek gratification vicariously through addictive behaviours for soothing or stimulation. On the other hand, under conditions of psychological and physical safety, a person could risk vulnerability and congruence to reveal their intrapsychic experience in the presence of another as well as be open to receive them.

Intergenerational Level. The patterns by which people function and behave are heavily influenced by their childhood experiences with parents or caregivers. These patterns, often considered intergenerational influences, tend to be less consciously recognized and are unconsciously internalized, carrying over into adulthood (Lee, 2017). Numerous studies indicate that over 80% of individuals with addictive behaviors have histories of abuse and neglect during their childhood (Bernstein, 2000). These negative intergenerational influences are even found to diminish the effectiveness of treatments by causing permanent dysfunctions in central neurotransmission systems (Lotzin et al., 2016). In light of this, addiction can be viewed as an adaptation to soothe persistent psychological distress rooted on past traumas, or as an emotional response to repeated disappointments in relationships (Lee, 2017; Padykula & Conklin, 2010).

Research Gap in Existing IGD Models

As suggested by above models and theories, IGD is a complex behavioral addiction influenced by multiple factors and correlated with relational dynamic issues. However, a IGD conceptual model that integrates adverse childhood experiences and communication patterns

with emotion dysregulation, family relationship dissatisfaction, and psychological distress is still lacking. A relational model can provide a more contextualized, systemic and relational understanding of the disorder. Several models have been employed to explain the development of IGD, including the dual process model, the cognitive-behavioral model, and the congruence model. Each of the above models offers unique insights into the different aspects that contribute to IGD, and the present study will mainly focus on the relational model provided by Congruence Couple Therapy based on the indications that families and relationships are often implicated in the occurrence and development of IGD that appear salient but have not yet been explored together.

Moreover, the congruent communication is introduced as a new variable in the IGD research field. Many existing communication measures are uni-dimensional and focused on communication satisfaction (Jones et al., 2017; Christensen & Heavey, 1990; McCubbin et al., 1998). The Congruent Communication Scale (CCS) was selected for this variable, because it offers an assessment of communication styles by identifying a typology of six communication postures: Superior, Inferior, Enmeshed, Fixing, and Avoidant (Lee & Isik, in process). The CCS is grounded in a relational and systemic framework that conceptualizes addiction as stemming from incongruence across four inter-related dimensions: intergenerational (e.g., ACEs), interpersonal (e.g., communication patterns), intra-psychic (e.g., emotional regulation, psychological distress), and universal-spiritual (Lee, 2009; Lee, 2015; Lee et al., 2023). This comprehensive perspective underlying CCS and congruent communication aligns with the present study's focus on family-related and psychological factors associated with IGD.

Conclusion

This literature review section provides an overview of IGD, highlighting its clinical definition, psychological, cognitive, and physical consequences, and various risk factors. While existing models like the dual process and cognitive-behavioral models offer valuable insights, the review argues that a relational model, like the one provided by CCT, invites further exploration to fully grasp the complex interplay of family dynamics and past traumas in the development of IGD. The review strongly positions emotion regulation (both intrapersonal and interpersonal) as a key variable that mediates the impact of ACEs on the development of IGD. The evidence suggests that early life adversity can lead to impaired emotion regulation, dysfunctional communication, and poor relationship quality, which in turn increase an individual's vulnerability to using gaming as a maladaptive coping mechanism for psychological distress. Understanding these relational and emotional factors is necessary for the following discussion and study for IGD.

CHAPTER 3. METHODOLOGY

Research Purpose and Hypothesis

The first aim of the present study is to elucidate how ACEs are associated with the severity of IGD, psychological distress and family relationships. The second aim is to examine the inter-correlations among ACEs, severity of IGD, family relationship quality, congruent communication, emotion dysregulation, and psychological distress. And the third aim is to explore the combined predictive value of these IGD-related variables on IGD severity.

The following hypotheses will be tested:

H1: ACEs are positively correlated with IGD severity.

H2: IGD severity, ACEs, congruent communication, family relationship quality, emotion dysregulation, and psychological distress are significantly interrelated.

H3: ACEs, psychological distress, emotion dysregulation, family relationship dissatisfaction, and congruent communication each serves as significant predictors of IGD severity.

Study Design

This study employs a cross-sectional, quantitative research design and includes individuals identified as at risk for IGD based on the Gaming Addiction Scale 7 items (GAS-7). A total of 179 emerging Canadian adults aged 18 to 29 participated in the study, all residing in Canada and screened as having potential IGD using the GAS-7. Recruitment was conducted through volunteer sampling from the participant pool of the market research company Leger.

The inclusion criteria required participants to be between 18 and 29 years of age, to be either Canadian citizens or currently residing in Canada, and to have scored 3 (“often”) or higher on at least four out of the seven screening items of the Gaming Addiction Scale–7 (GAS-7).

Descriptive statistics were first conducted to summarize sociodemographic characteristics of the sample using SPSS. In line with the revised hypotheses, statistical analyses focused on examining correlations among the primary variables of interest: ACEs, IGD severity, congruent communication, family relationship quality, emotion dysregulation, and psychological distress. Bivariate correlation analyses (Pearson's *r*) were employed to assess the direction and strength of associations between these constructs. In addition, multivariate correlation matrices were used to examine interrelationships among the full set of variables, providing a comprehensive overview of their connections. Multiple regression analysis is also used to test the H3, showing the predictive power of variables.

Measures

Adverse Childhood Experiences Revised Questionnaire (ACE-Q)

The ACE-Q is a 10-item questionnaire adapted from the original CDC-Kaiser ACE questionnaire, which is designed to assess adverse and traumatic experiences individuals encountered during their initial 18 years of life (Felitti et al., 1998). It encompasses three categories of abuse (emotional, physical, and sexual), five types of household challenges (substance abuse, mental illness within the household, domestic violence, incarceration of a household member, and parental separation or divorce), and two types of neglect (emotional and physical) (Prentice et al., 2022; Merrick et al., 2017). Respondents provide answers in a Yes or No format. The total number of affirmative responses are added to quantify the number of experienced ACEs, and a higher score indicates a greater number of adverse childhood experiences. The reliability was found to be Cronbach's $\alpha = .89$ for all ten items demonstrating good internal consistency. Factorial validity was demonstrated with strong correlation between

two factors (i.e. indirect family-related adversities and direct adverse experiences) r = .56 (Van der Feltz-Cornelis & Beurs, 2023).

Gaming Addiction Scale – 7 items (GAS-7)

The GAS-7 is a seven-item scale developed from the original 21-item version of GAS (Lemmens et al., 2009). Each item on the scale is introduced with the prompt, 'How often during the last six months have you...?' followed by statements such as 'thought all day long about playing a game?' or 'played games to forget about real life?' Participants respond using a 5-point rating scale: 1 (never), 2 (rarely), 3 (sometimes), 4 (often), 5 (very often). Respondents who answered at least 3 out of 5 are considered to have met the criteria for each item. The scale specifies a cut-off of 4 out of 7 items met for screening individuals as potential gaming disorder patient, aligning with the diagnostic requirements of the DSM-5. The overall GAS score has exhibited a high reliability (Cronbach's alpha=.86) in the original validation study (Lemmens et al., 2009). The concurrent validity of the GAS is further supported by its significant correlation with time spent gaming, with correlation coefficients ranging from 0.549 to 0.576 (Liu et al., 2020; Lemmens et al., 2009).

Family Satisfaction Scale (FSS)

The Family Satisfaction Scale (FSS) is a 10-item scale adapted by Olson (2010) from the original 14-item version. It measures family members' satisfaction across three key aspects of family function: family closeness, flexibility, and communication. Each item begins with the prompt, 'How satisfied are you with...' followed by specific statements, such as 'the degree of closeness between family members' or 'the way problems are discussed'. Respondents rate their satisfaction on a 5-point scale: 1 (very dissatisfied), 2 (somewhat dissatisfied), 3 (generally satisfied), 4 (very satisfied), and 5 (extremely satisfied). Olson (2011) reports that the FSS

demonstrates excellent reliability, with a Cronbach's alpha of .93. Compared with previously validated scales such as the Family Communication Scale (FCS; Vegas et al., 2022), the FSS also demonstrates strong convergent validity, as indicated by a high correlation coefficient (r = .788).

Difficulties in Emotion Regulation Scale – 16 item version (DERS-16)

The DERS is a 5-point Likert-type scale composed of 16 items, designed to assess five dimensions of emotion regulation difficulties (Bjureberg et al., 2016). These dimensions encompass avoiding adverse feelings, impaired pursuit of objectives when distressed, challenges in managing impulses during periods of distress, limited accessibility to effective emotional regulation techniques, and a lack of clear understanding of emotions. Respondents are presented with 16 items, including statements such as 'I am confused about how I feel' and 'When I am upset, I feel like I am weak'. They rate their responses on a scale ranging from 1 (almost never) to 5 (almost always). A higher score indicates greater difficulties in emotion regulation. Even though the DERS-16 was adapted from the original 36-item version, researchers have found that the DERS-16 exhibits good internal consistency (α = .92) and demonstrates a strong correlation with the original version (r = .93).

Kessler Psychological Distress Scale (K6)

The K6 is a six-item scale designed to assess the frequency of non-specific psychological distress experienced within the past 30 days (Prochaska et al., 2012). Respondents are asked to indicate 'how much of the time' they felt various emotions over the past month. The specific feelings to be rated include 'nervous,' 'hopeless,' 'restless or fidgety,' 'so depressed that nothing could cheer you up,' 'everything was an effort,' and 'worthless' (Kessler et al., 2010). Respondents rate each item on a scale from zero (none of the time) to four (all the time), and a summed score equal to or greater than 13 indicates a high likelihood of mental illness. Previous

clinical studies have consistently validated the K6 scale as a sensitive screening instrument for severe mental disorders in population-based health surveys (Veldhuizen et al., 2007). Additionally, the K6 has demonstrated excellent internal consistency and reliability, with Cronbach's $\alpha = 0.89$. A study conducted in Canada demonstrated that the K6 scale provides accurate predictions of various mental disorders, with Area Under the Curve (AUC) scores ranging from 0.847 to 0.853. These results were obtained when the scale was compared with the WHO version of the Composite International Diagnostic Interview 3.0 (WHO-CIDI) (Ferro, 2019).

Congruent Communication Scale (CCS)

The Congruent Communication Scale, an 18-item, 5-point scale developed by Lee & Isik (under review), assesses individuals' awareness of their habitual communication styles, particularly under stress. Originally designed to measure communication between partners, the CCS will be adapted in this study to evaluate communication within family settings. Participants will respond to statements like 'I withdraw into myself and stay silent in a disagreement' on a scale from 1 (almost never) to 5 (almost always). Although the CCS comprises six subscales (superior, inferior, fixing, enmeshed, avoidant, and congruent), only the nine items from the congruent subscale will be used to calculate the total congruent communication score. The total congruent communication score is employed, because it specifically captures the adaptive, balanced form of communication central to the theoretical construct of congruent communication and represents the degree of communication congruence with a family member or a significant other when under stress. The Cronbach’s alpha for the total congruent communication score on the CCS is 0.75, indicating good reliability. And CCS also shows significant correlations with other relevant measures, such as correlating with the Constructive Communication subscale of

the Communication Patterns Questionnaire-Short Form (CPQ-SF) at $r = .48$ ($p < .001$), and with the Dyadic Adjustment Scale-7 (DAS-7) developed by Hunsley et al. (2001), at $r = .42$ ($p < .001$). These correlations supported CCS's validity in assessing congruent communication within interpersonal relationships. CCS items can be found upon the scale's publication (Lee & Isik, 2025).

Procedure

As part of the data collection process, a commercial survey panel, Leger was contracted for the purpose of recruitment to obtain a representative Canada-wide sample. Potential participants received the link of this survey from the Leger platform and referred to Qualtrics for survey completion. On the web-based questionnaire tool Qualtrics Questionnaire (https://www.qualtrics.com), participants first provided their informed consent and then completed the GAS-7. Respondents who scored 3 ("often") or higher on at least 4 out of the 7 screening items were considered to meet the inclusion criteria and were directed to the next questionnaire page, where they filled out a demographic questionnaire (age, gender, ethnicity, family status, gaming time spent, and primary gaming type). Only participants aged 18 to 29 years were included in this study to ensure a focus on young adults. When inquiring about the primary gaming type, participants were presented with four options with examples: action, role-playing, simulation, and strategy. This classification of game genres, as differentiated by Apperley (2006), is widely accepted. Then, participants completed the ACE-Q, FSS, Congruent Communication Scale, DERS-16, and K6. Upon the completion of all questionnaires, participants were directed back to the Leger platform and received their compensation from Leger. The incentives were handled by Leger that each participant who completed the survey received 1800 LEO points, equivalent to $1.80. Altogether, participants responding to the

questionnaires spent approximately 13-18 minutes. Uncompleted questionnaires were excluded from the data analysis section and participants were only compensated by Leger when they completed the entire study. In this study, attention check questions were also embedded within the survey to ensure data quality and to identify inattentive or careless responses.

Ethical Considerations

This study received ethics approval from the University of Alberta Research Ethics Board 2 (REB 2) on March 24, 2025 (Ethics ID: Pro00145684). Approval was granted following submission through the University of Alberta's online research ethics system, in accordance with the requirements outlined on the University of Lethbridge Research Ethics website (https://www.ulethbridge.ca/research/human-research-ethics). The approval confirms that the study meets the ethical standards stipulated in the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans, TCPS 2 (2018).

Given the sensitive nature of recalling adverse childhood experiences, careful attention was given to risk assessment and participant well-being. Participants were informed of the potential for emotional distress before providing consent and were given access to mental health resources, including referral options and the 24-hour distress line (988). The survey design emphasized participant autonomy, allowing individuals to withdraw from the study at any stage without penalty. Informed consent was documented electronically, with a clear and accessible form outlining the study's purpose, procedures, risks, and benefits (see Appendix A). No personally identifiable information was collected, and all data were anonymized. Data were encrypted, securely stored, and accessible only to the research team. As this is an unfunded study, the risk of conflict of interest is minimal, and the research team remains committed to

transparency and ethical accountability at every stage of the study, from recruitment to dissemination of results.

Data Analysis

Data analysis was conducted using IBM SPSS Statistics (Version 29). First, descriptive statistics were generated to summarize the demographic characteristics of participants, including age, gender, ethnicity, education level, gaming time, gaming frequency, and primary game type. Frequencies, percentages, means, and standard deviations were computed to provide a comprehensive overview of the study sample. This step ensured a clear understanding of the sociodemographic profile of participants and contextualized subsequent analyses.

Following the descriptive analysis, statistical procedures were employed to examine the study hypotheses. Pearson's correlation analyses were conducted to test associations between ACEs, IGD severity, congruent communication, family relationship quality, emotion dysregulation, and psychological distress. Correlation matrices were used to present the direction and magnitude of these relationships across all variables of interest. This approach allowed for an evaluation of the hypothesized positive or negative associations among the constructs.

The regression analysis was conducted and reported to examine the relative contributions of ACEs, psychological distress, family relationship satisfaction, emotion dysregulation, and congruent communication in predicting IGD severity. This analysis helps to explore predictive relationships, compare the relative importance of variables, clarify overlapping effects, and generate hypotheses for future research.

All statistical results, including coefficients, effect sizes, and significance levels (p-values), were systematically reported in APA7 format. The findings were later interpreted in the discussion chapter with reference to prior literature, highlighting the implications for

understanding the interplay between early adverse experiences, relational processes, emotion regulation, psychological well-being, and gaming behaviors among Canadian emerging adults.

CHAPTER 4. RESULTS

This chapter presents the sample characteristics and the results of analyses investigating the associations among adverse childhood experiences, psychological distress, emotion dysregulation, family satisfaction, congruent communication, and Internet Gaming Disorder severity. Descriptive statistics, correlation analyses, and regression analyses were employed to examine hypotheses listed in the Method section. The reliable prevalence rate of IGD can not be determined in this study, because (1) Leger panel's pre-screening data in setting up the panel based on age and residency was not made available to the researcher, and (2) those excluded were also for reasons of failing attention checking questions and not only based on GAS-7 screening.

Testing Assumptions of Correlation and Regression Analysis

Before the analysis, a total of two outliers were identified and removed as their responses showed a consistent pattern across the whole survey in answering all question items with only value 1 or value 5. After the manual remove of outliers and low-quality data, testing for assumptions was conducted.

For Pearson correlation analysis, we confirmed that all levels of measurement were continuous, and no outliers were detected. Scatterplots indicated that the relationships between variables were linear and homoscedastic. Tests of normality (i.e. Shapiro–Wilk) indicated that most variables deviated significantly from normality. However, given the large sample size (N = 179), the Pearson correlation coefficient is robust to moderate violations of normality, allowing us to select Pearson's correlation as the primary measure of association (Havlicek & Peterson, 1976; Nefzger & Drasgow, 1967). Moreover, skewness values ranged from -0.089 to 0.929 and kurtosis values from -0.692 to 0.477 in the present study. Both skewness and kurtosis values for

each variable did not exceed +1.5 or -1.5 threshold, which indicating the present sample data meet the requirement on normality.

For multiple regression analysis, all assumptions were meet. Scatterplots still indicated that linearity, and residuals were also homoscedastic. Standardized residuals ranged between -1.91 and 3.05, suggesting no extreme outliers, and the Durbin–Watson statistic (2.219) indicated independence of errors. Residuals were approximately normally distributed, and multicollinearity diagnostics (Tolerance > .49, VIF < 2.04) indicated no multicollinearity concerns, since all VIF was not above 10 and Tolerance was all above .10 (Osborne & Waters, 2022).

Descriptive Statistics

Participants' Demographics

Participants (N = 179) ranged in age from 18 to 29 years (M = 24.64, SD = 3.28). Male participants (n = 88) had the mean age of 25.05 years (SD = 3.21), and female participants (n = 85) had a mean age of 24.32 years (SD = 3.30). Participants identifying as non-binary or third gender (n = 6) had a mean age of 23.33 years (SD = 3.78), a median age of 22.00 years.

Regarding education level, participants (N = 179) most commonly reported having completed either a secondary school diploma (n = 54, 30.2%) or a bachelor's degree (n = 54, 30.2%). Other participants had completed a college diploma (n = 42, 23.5%) or a post-graduate degree (n = 28, 15.6%). Only one participant (0.6%) reported primary school as their highest level of education.

In terms of ethnic origin, the largest groups identified as having European origins (n = 66, 36.9%) and Asian origins (n = 55, 30.7%). Additional groups included participants of other North American origins (n = 25, 14%), African origins (n = 10, 5.6%), North American

Aboriginal origins (n = 9, 5.0%), Caribbean origins (n = 6, 3.4%), and Latin, Central and South American origins (n = 6, 3.4%). One participant (0.6%) reported Oceanian origins, and one participant (0.6%) identified as mixed ethnicity.

IGD and Other Addictions

Among participants (N = 179), 57 individuals (31.8%) reported struggling with other addictive problems, whereas 122 participants (68.2%) reported no such difficulties. The types of other addictions reported included nicotine use (e.g., smoking, vaping; n = 14), alcohol use (n = 5), gambling (n = 7), drug use including cannabis or marijuana (n = 8), excessive spending or shopping (n = 3), social media use (n = 3), food-related issues such as binge eating or eating disorders (n = 6), pornography or sex use (n = 3), mobile phone or screen use (n = 3), caffeine consumption (n = 3), and various other behaviors such as skin picking, obsessive interests, or self-harm (n = 6). Among all these 57 participants, several of them reported experiencing multiple addictions (n = 10) or described having an addictive personality without specifying a single addictive behaviour/substance (n = 1).

Participants' Gaming Habit

Participants reported spending an average of 18.17 hours per week on digital gaming activities (SD = 16.86). Regarding the types of digital games played most frequently, action games were the most common choice (n = 54, 30.2%), followed by stimulation games (n = 40, 22.3%), role-playing games (n = 37, 20.7%), strategy games (n = 37, 20.7%), and other game types (n = 11, 6.1%). The "Other" category included responses such as variety games, Tetris, sports and arcade-style games, simulation, sandbox, life simulations, first-person shooter games, fashion games, and participants who indicated playing all game types. In terms of preferred

gaming devices, 72 participants (40.2%) reported primarily using a smartphone, 58 participants (32.4%) used a game console, and 49 participants (27.4%) preferred a personal computer.

Communication Partner

Participants in this study specified a range of communication partners when completing the Congruent Communication Scale. The largest group reported communicating with a parent (n = 74, 41.3%), followed by those who identified spouse or partner (n = 59, 33.0%). Smaller numbers identified friend (n = 18, 10.1%) or other relatives (n = 5, 2.8%). In addition, 22 (12.3%) participants reported other types of communication partner, including either unspecified communication partners or non-family/non-intimate figures such as supervisors, employers, or co-workers.

Correlational Analysis

Table 1. Descriptive Statistics and Correlational Analysis

Variable	*n*	*M*	*SD*	1	2	3	4	5	6
1. ACE	179	2.22	2.15	—					
2. Congruent communication	179	30.73	5.25	-.06	—				
3. Family relationship dissatisfaction	179	26.14	7.99	.51***	-.14	—			
4. Emotion dysregulation	179	46.31	13.74	.39***	-.31***	.38***	—		
5. Psychological distress	179	17.63	5.19	.41***	-.23**	.47***	.67***	—	
6. IGD severity	179	22.11	3.68	.19**	-.21**	.11	.23**	.22**	—

*p < .05. **p < .01. ***p < .01.

Pearson's correlations were conducted to examine associations among the study variables (see Table 1). ACEs were significantly associated with family relationship dissatisfaction, r (177) = .51, p < .001, higher psychological distress, r (177) = .41, p < .001, and greater emotion dysregulation, r (177) = .39, p < .001. ACEs were also positively correlated with IGD severity, r (177) = .19, p = .010.

IGD severity itself was significantly correlated with higher psychological distress, r (177) = -.22, p = .003, and greater emotion dysregulation, r (177) = .23, p = .002. Poor Family relationship quality (i.e. Family relationship dissatisfaction) was related to both psychological distress, r (177) = .47, p < .001, and emotion dysregulation, r (177) = .38, p < .001. However, IGD severity is not significantly correlated with family relationship dissatisfaction, r (177) = .11, p = .161.

Congruent communication was not significantly associated with ACEs, r (177) = -.06, p = .456. The correlation between congruent communication and family relationship dissatisfaction is also non-significant, r (177) = -.14, p = .061. However, it was significantly related to other variables in a weak but significant level. Congruent communication was negatively correlated with IGD severity, r (177) = -.21, p = .006, and emotion dysregulation, r (177) = -.31, p < .001. Moreover, Congruent communication was also negatively correlated with psychological distress, r (177) = -.22, p = .002. Overall, the correlation matrix indicated that the study variables were meaningfully interrelated in the expected directions, indicating a future regression analysis would be meaningful.

Regression Analysis

Table 2. Regression Analysis Result

Variable	B	*SE*	95% CI		β	*p*
			LL	*UL*		
Constant	23.576	2.331	18.974	28.177	-	<.001
ACEs	0.248	0.151	-0.049	0.546	0.145	.101
Congruent communication	-0.112	0.054	-0.218	-0.006	-0.160	.039
Emotion dysregulation	-0.032	0.041	-0.113	0.049	-0.069	.441
Family relationship dissatisfaction	0.021	0.027	-0.033	0.074	0.077	.453
Psychological distress	0.074	0.073	-0.071	0.219	0.104	.314

Note. R^2 = .094, F (5, 173) = 3.575, p = .004

A multiple regression analysis was conducted to examine whether ACEs, psychological distress, family relationship dissatisfaction, emotion dysregulation, and congruent communication predicted IGD severity. The overall regression model was statistically significant, F (5, 173) = 3.575, p = .004, accounting for 9.4% of the variance in IGD severity (R^2 = .094, Adjusted R^2 = .067). Although the regression model explained only 9.4% of variance, this is consistent with the complex, multi-determined nature of behavioral addictions. Moreover, we found congruent communication is the only significant contributor for this variance (β = -.160, p = .039). Except for congruent communication, none of other predictors emerged as significant contributors. ACEs (β = .145, p = .101), psychological distress (β = .104, p = .314), family relationship dissatisfaction (β = -.069, p = .441), and emotion dysregulation (β = .077, p = .453) were found to be non-significant predictors of IGD severity.

Conclusion

Overall, the findings suggest that although ACEs and psychosocial vulnerabilities are mostly significantly correlated, their combined contributions to IGD severity were modest and potentially overlapping except congruent communication. This underscores the multifactorial nature of IGD and indicates that counseling interventions may need to address a constellation of emotional and relational factors rather than focusing on a single dominant predictor. And congruent communication is highlighted as an important variable which is different from others in predicting the IGD severity. A more detailed interpretation of these findings, along with limitations, explanations of the results, and implications, are presented in Chapter Five.

CHAPTER 5. DISCUSSION

This study has examined associations among ACEs, IGD severity, psychological distress, emotion dysregulation, family relationship quality, and congruent communication in a sample of emerging adults screened as at risk for IGD ($N = 179$). Three hypotheses were tested and partially supported.

Overview: Interpretation of Results

The hypothesis posed for this study were:

H1: ACEs are positively correlated with IGD severity.

H2: IGD severity, ACEs, congruent communication, family relationship quality, emotion dysregulation, and psychological distress are significantly interrelated.

H3: ACEs, psychological distress, emotion dysregulation, family relationship dissatisfaction, and congruent communication would each serve as significant predictors of IGD severity.

In the H1, ACEs were found to be positively associated with IGD severity, although the effect was weak ($r = .19$, $p = .010$). This result is broadly consistent with theoretical models of early adversity as a distal vulnerability for maladaptive coping and with prior studies linking trauma histories to addictive digital engagement (Brand et al., 2019; Lee, 2017; Padykula & Conklin, 2010). The details of this association will be examined more fully in the following section.

In the H2, we suggested that IGD, ACEs, congruent communication, family relationship quality, emotion dysregulation, and psychological distress would be significantly interrelated. This hypothesis is only partially supported, with most of the associations being significant: higher ACEs related to greater psychological distress, greater emotion dysregulation, and higher

family relationship dissatisfaction. And IGD severity was positively associated with psychological distress and emotion dysregulation. Only three correlations between variables were found to be non-significant: IGD severity is not significantly correlated with family relationship dissatisfaction (p = .161), and congruent communication is also not significantly correlated with ACEs (p = .456) and family relationship dissatisfaction (p = .061).

In the H3, we proposed that all five predictors would significantly predict IGD severity in a multiple regression model, and this hypothesis was only partially supported. The overall regression model was statistically significant, F (5, 173) = 3.575, p = .004, with an R^2 of .094 (adjusted R^2 = .067), indicating that the combined predictors explained approximately 9.4% of the variance in IGD severity. However, when examining the significant contributions of each predictor, only congruent communication emerged as a statistically significant predictor (β = -.160, p = .039). Specifically, greater congruent communication was associated with lower levels of IGD severity, suggesting that individuals who were more consistent in aligning their internal feelings and thoughts with external communication tended to engage less in problematic gaming. The non-significance of other predictors likely reflects overlapping variance among psychological and relational risk factors, which will be discussed in the following sections.

Detailed Exploration of Correlation Analysis Results

To interpret results for H2 in a coherent way, the correlation analysis results will be discussed and organized into four thematic clusters. The first theme examines IGD severity relates to mental wellbeing factors, specifically psychological distress and emotion dysregulation. The second theme considers how IGD is associated with relational factors, including ACEs and family relationship dissatisfaction. These variables capture the influence of both early-life adversity and current family dynamics, which have been highlighted in the

literature as important relational contexts for addictive behaviors. The third theme addresses the associations among mental wellbeing and relational factors, leading to introducing IGD within a broader network of interconnected risks. In the last theme, Congruent Communication as a variable newly introduced into IGD research will be treated as a distinct construct, as it reflects the relational-communicative mechanisms that involves both family dynamics and psychological well-being. This discussion structure will ensure that all correlations are systematically examined, highlighting how these different variables interact in correlation with IGD.

IGD and Mental Well-being Factors

The first theme focuses on the relationship between IGD and mental well-being factors. Specifically, this part will consider how psychological distress and difficulties in emotion regulation are associated with IGD in the present study, and how their correlations are consistent with previous studies. Moreover, the relationship between psychological distress and emotion dysregulation is also discussed to explore the inter-relational dynamic among these two mental well-being factors.

IGD and Psychological Distress. IGD severity is found to be positively associated with psychological distress ($r = .22$, $p = .003$), indicating that individuals who reported higher levels of distress also experienced more severe IGD symptoms. This finding is consistent with a substantial body of research that demonstrated IGD is linked to elevated symptoms of depression, anxiety, and general psychological distress (Kim et al., 2016; Gursesli et al., 2025; Rahul et al., 2025). In a systematic review, Gursesli et al. (2025) reported that 67% of included articles found effect sizes greater than $r = .30$ for the correlation between IGD and psychological distress, and all 42 studies reported significant associations.

Although the present study is cross-sectional and therefore cannot establish causality, there is still longitudinal evidence indicating that the relationship between IGD and psychological distress may be bidirectional. A recent systematic review and meta-analysis of 30 cohort studies (N = 28,782) found that gaming disorder symptoms predicted later depression and reduced life satisfaction, while depression, anxiety, loneliness, and other emotional difficulties also significantly predicted subsequent increases in gaming disorder symptoms, suggesting a reciprocal association (Amendola et al., 2025). Similarly, Li et al. (2023), using Directed Acyclic Graphs (DAGs) to explore causal directions within cross-sectional data, also found that the association between IGD and psychological distress was bidirectional rather than unidirectional.

Specifically, distress can increase vulnerability to problematic gaming as individuals use games as a maladaptive coping mechanism, while excessive gaming may in turn exacerbate stress and emotional problems over time (Snodgrass et al., 2014; Reinecke, 2009). Taken together, the present findings support the view that psychological distress is a key correlate of IGD and highlight the importance of addressing underlying emotional difficulties in both prevention and intervention strategies.

IGD and Emotion Dysregulation. In the present study, IGD severity was found to be positively correlated with emotion dysregulation (r = .23, p = .002), indicating that individuals with higher levels of IGD severity also tended to report greater difficulties in regulating their emotions. Although the effect size is small, this significant relationship reflects a consistent pattern in the literature suggesting that maladaptive emotion regulation plays a central role in behavioral addictions (Lin et al., 2023; Lin et al., 2020).

Prior studies have shown that emotion dysregulation is associated with increased vulnerability to IGD, as individuals may rely on gaming as an avoidant coping strategy to escape

or downregulate negative emotions (Yen et al., 2018; Estupiñá et al., 2024). Another study employed both cross-sectional and longitudinal design has further supported this link, demonstrating that deficits in emotion regulation predict the development and maintenance of IGD symptoms (Schettler et al., 2024). The present result reinforces the conceptualization of IGD as a disorder rooted in emotional and psychological vulnerabilities, indicating the importance of strengthening emotional regulation skills as part of both prevention and treatment efforts for IGD.

Psychological Distress and Emotion Dysregulation. Since both psychological distress and emotion dysregulation are associated with IGD severity, the present study also found a significant positive correlation between these two variables ($r = .67$, $p < .001$). This result is consistent with a large body of research indicating that psychological distress and emotion dysregulation are closely linked (Bonanno & Burton, 2013; Rudenstine et al., 2019). Emotion regulation difficulties are often considered a mechanism through which psychological distress is maintained or exacerbated, as individuals with poor regulation skills may struggle to manage stressors effectively, leading to prolonged or intensified distress (Sheffler et al., 2019; Gratz & Roemer, 2008). Prior studies on behavioral addictions and IGD specifically have also emphasized the role of emotion regulation difficulties as both correlates and predictors of psychological distress (Henden, 2023; Squires et al., 2021; Meyer & Segai, 2023). Thus, the present finding aligns with theoretical and empirical evidence showing that these two factors tend to cluster together.

In practice, our result indicated individuals who are more psychologically distressed may also employ gaming as an avoidance or emotion regulation strategy, while those with poor

regulation skills may be less able to cope with distress without resorting to maladaptive behaviors such as excessive gaming.

IGD and Relational Factors

The second theme focuses on associations between relational factors and IGD severity. Specifically, this part will explore how early-life adversity (i.e. ACEs) and current family dynamics (i.e. family relationship dissatisfaction) are associated with gaming problems. The correlation between ACEs and family relationship dissatisfaction will also be discussed. This theme will reflect how disruption in family/relational contexts across lifespan is correlating to the IGD severity.

IGD and ACEs. The correlation analysis has indicated a very weak but significant positive correlation between ACEs and IGD ($r = .19$, $p = .010$). This result is theoretically consistent with models that suggested early adversity as a distal vulnerability factor for later maladaptive coping (e.g., I-PACE; Brand et al., 2019). And this result also confirmed findings of previous studies on how trauma-related histories are linked to addictive patterns of digital engagement (Dong & Potenza, 2014; Baller & Lewis, 2022; Richard et al., 2023). Altogether this correlation between ACEs and IGD is very weak but still consistent with previous studies that reported a correlation coefficient ranging from .166 to .20 (Jhone et al., 2021; Grajewski & Dragan, 2020).

The weak effect size observed between ACEs and IGD may be best explained by the presence of multiple indirect pathways mediating this association. While early adversity establishes a background of vulnerability, its influence on IGD is more likely transmitted through proximal mechanisms as highlighted in the literature review and supported by the present study's results. For example, prior research has shown that ACEs predicted deficits in emotion regulation

and increased levels of psychological distress, both of which are well-established risk factors for IGD (Poole et al., 2018; Agbaje et al., 2021; Elhai et al., 2017; Estévez et al., 2017). Similarly, ACEs exert long-term effects on family dynamics, leading to reduced cohesion and heightened relational conflict (Wang et al., 2021; Khalifian et al., 2022), which in turn are associated with problematic gaming behaviors (Sarour & El Keshky, 2023; Tajalli & Zarnaghash, 2017). In conclusion, these findings suggest that ACEs do not strongly correlate with IGD directly but rather operate through a network of psychological and relational vulnerabilities. The weak yet significant correlation observed in this study might reflect the distal role of ACEs as a background risk factor, rather than a proximal determinant of gaming problems.

IGD and Family Relationship Quality. In the present study, no significant correlation was found between IGD severity and family relationship dissatisfaction ($p = .161$). This finding contrasts with prior research demonstrating that problematic or low-quality family relationships have been identified as significant risk factors for IGD, while higher quality relationships often serve as protective factors (Mohamed et al., 2023; Teng et al., 2020). One explanation for this result may be that broad measures of family dissatisfaction are not direct predictors of IGD. For instance, Wang et al. (2023) showed that parental marital conflict predicted IGD indirectly through mediating variables such as deviant peer affiliation. Since family context may shape IGD primarily through complex pathways rather than straightforward direct effects, family relationship dissatisfaction may be too general a construct to adequately capture the relevant dimensions of family functioning associated with IGD.

Another possible explanation for the non-significant result is that the non-significant finding reflects issues of statistical power. A previous meta-analysis suggested that family factors typically exert a small effect on problematic gaming or internet use, with most included studies

(78.8%) reporting small effect sizes (Cohen's d = 0.20–0.49; Nielsen et al., 2020). With a sample size of 179, the present study was adequately powered to detect medium-sized effects but may have been underpowered to reliably detect effects of small magnitude (Hulley et al., 2001). Thus, the absence of a significant correlation may not indicate a lack of association, but rather that the small effect size commonly observed in previous literature could not be captured in this sample.

The last possible explanation relates to cultural differences, as the present study was conducted within a Western population. A systematic review by Ergin and Essau (2025) highlighted that the role of negative family factors in IGD has produced conflicting findings across different cultural contexts. However, detailed evidence on how cultural differences may account for such inconsistencies remains limited, as cross-cultural variations in the risk factors for IGD are still underexplored (Fernandez, 2015). Taken together, these results suggest that while family factors remain relevant to understanding IGD, the absence of a significant correlation in the current study may reflect the limitations of using global indices of family dissatisfaction, the indirect influence of mediating psychosocial processes, and the moderating role of cultural or sample-specific factors.

ACEs and Family Relationship Quality. Moreover, ACEs were found to be moderately and positively correlated with family relationship dissatisfaction (r = .51, p < .001). This association reflects the enduring impact of early adversity on later relational satisfaction, suggesting that the effects of ACEs may extend to correlated with current family relationships. This finding is consistent with few previous studies suggesting that more exposure to ACEs is associated with more severe disrupted attachment patterns, more family conflict, and lower levels of cohesion and support in later family life (Wang et al., 2021; Lorenzo et al., 2024; Banks, 2023). For example, previous research has shown that ACEs predict impaired parent–

child communication and reduced family satisfaction during adolescence and adulthood, thereby perpetuating a cycle of relational strain (Khalifian et al., 2022; Shonkoff et al., 2012). This result is also partially consistent with the study of Khanna and Kumari (2024), which indicated ACEs negatively correlated with romantic relationship satisfaction through the ACEs caused anxiety attachment styles.

By confirming that higher ACE exposure is linked with greater dissatisfaction in family relationships, this study highlights the relational, lifespan-long influencing, and systemic nature of ACEs. It also suggests that interventions targeting IGD and related psychosocial outcomes may benefit from integrating trauma-informed and family-based approaches.

Inter-related Mental Well-being Factors and Relational Factors

In addition to examining how psychological and relational variables correlate with IGD independently, the present study also explored the interconnections among these factors. This theme focuses on the relationships between mental well-being factors and relational factors**.** By examining these interrelations, the present study will suggest that psychological and relational domains are not isolated, but rather form an interconnected network of vulnerabilities.

ACEs and Psychological Distress. In the present study, ACEs were moderately positively correlated with psychological distress ($r = .41$, $p < .001$). This finding is highly consistent with a large body of literature linking greater exposure to childhood adversity with increased mental health problems in later life (Irshad & Lone, 2025; Read et al., 2018). For example, the seminal ACEs study by Felitti et al. (1998) showed a dose-response relationship between the number of adverse experiences and the risk of depression, anxiety, and other forms of psychological distress in adulthood. Numerous studies and reviews have also confirmed that individuals with a history of multiple ACEs are significantly more likely to report greater

psychological distress and even diagnosable mental disorders, compared to those with few or no ACEs (Sahle et al., 2022; Hughes et al., 2017; Irshad & Lone, 2025). Another study on health profession students found that higher ACE scores for reporting experienced at least four types of ACEs were linked to significantly higher distress levels (Sciolla et al., 2025).

To understand the correlation, there is theoretical framework can help to explain why ACEs are so strongly associated with psychological distress. According to Nurius et al. (2015), the stress-process model indicates ACEs influences stress responses, threatens adaptive capacities, catalyze secondary stressors, and increases future stress exposures. These influences were inter-playing with later life factors to cumulatively shaping the psychological well-being, leading to a life-long cascades fostering proliferation of stress and psychological distress (Nurius et al., 2015; Hazel et al., 2008). Overall, the significantly positive correlation observed in our study is consistent with prior findings and helped us to view ACEs as risk factor for long-term psychological distress in later life.

ACEs and Emotion Dysregulation. The present study result indicated a weak to moderate level positive correlation between ACEs and emotion dysregulation ($r = .39$, $p < .001$), suggesting that participants who reported greater exposure to childhood adversity were also more likely to have more severe difficulties in emotion regulation. This result is consistent with a broad body of research identifying emotion dysregulation as a central mechanism linking ACEs to long-term psychological and behavioral outcomes.

Prior studies have shown that ACEs compromise the development of emotional monitoring and modulation skills, often leading to maladaptive strategies for emotion regulation (Bonanno & Burton, 2013; Runtz & Schallow, 1997). Meta-analytic evidence also confirms that individuals with ACEs are riskier to have general difficulties regulating emotions and are more

likely to rely on maladaptive strategies (Miu et al., 2022). Similarly, maltreatment by caregivers has been shown to impair both intrapersonal and interpersonal forms of emotion regulation, reducing reliance on adaptive strategies such as seeking reassurance or social support (Niedtfeld et al., 2025). These studies that sharing similar findings suggested that ACEs might disrupts the cognitive and relational foundations of healthy regulation, even though our study design does not support the causality.

Family Relationship Quality and Psychological Distress. Consistent with longstanding evidence, the present study found that family relationship dissatisfaction was significantly related to psychological distress (r = .47, p <.001). Participants who reported higher family relationships dissatisfaction tended to have higher levels of distress. According to Patrick et al. (2012), couple with low ratings of relationship satisfaction were associated with higher levels of moderate psychological distress, and this correlation is influenced by sex and severity of mental health issue. Røsand et al. (2012) also reported partner relationship dissatisfaction is strongly associated with emotional distress, and good perceived relationship strongly moderates adverse effects of various stressors. In parent-child relationships, child reported relationship satisfaction is also significantly correlated with their mental health (r = -.26, p < .001) (Schrodt & Afifi, 2007).

Conceptually, the family relationship dissatisfaction typically reflects lower perceived support, more frequent or unresolved conflict, and reduced confidence in family responsiveness. These conditions can undermine individual's ability develop adaptive strategies such as reappraisal and problem-solving and increase reliance on avoidance or suppression (Altan-Atalay & Saritas-Atalar, 2022; Christ et al., 2019; Gökdağ, 2021). Thus, our finding indicates that family relationship dissatisfaction might function as a proximal relational context for emotion dysregulation.

Family Relationship Quality and Emotion Dysregulation. The results of this study indicated that family relationship dissatisfaction was positively associated with emotion dysregulation (r = .38, p <.001). This result is consistent with previous studies demonstrating that dysfunctional or low-support family environments contribute to difficulties in emotion regulation. For example, Raposo and Francisco (2022) indicated that adolescents experiencing higher family conflict exhibited significantly more emotion regulation difficulties, compared to peers in more harmonious families. Similarly, adult's relationship satisfaction toward their couple is also negatively predicted by emotion dysregulation in nonacceptance of negative emotions, impulse control difficulties, lack or emotional awareness, and limited emotion regulation strategies (Xu et al., 2022). These findings align with our research result, indicating that no matter the dissatisfaction toward intimate or parent relationships are both significant correlator of emotion dysregulation.

Congruent Communication as Newly Introduced Variable

In the fourth theme, we will examine the relationship between congruent communication and family relationship dissatisfaction, emotion dysregulation, psychological distress, and ACEs. This discussion will be divided into three sections: congruent communication and psychological well-being, congruent communication and relational factors, and congruent communication as a protective factor in addictive behaviours.

Congruent Communication and Psychological Well-Being. The strongest association observed for congruent communication was its negative correlation with emotion dysregulation (r = -.31, p < .001). This aligns with extensive research showing that effective communication can serve as an IER strategy, reducing reliance on maladaptive coping mechanisms such as suppression or rumination (Miu et al., 2022). The negative correlation between congruent

communication and psychological distress is also significant (r = -.23, p = .002), indicating individual with higher communication congruence with communication partner usually experiences less psychological distress. This correlation is also consistent with previous study that emphasizes the stress-buffering role of supportive communication, which indicated when family members send consistent and validating messages, individuals feel understood and supported, which mitigates the effects of stress and reduces overall psychological strain (Floyd, 2024).

To better understand the relationship between congruent communication and psychological well-being, prior research indicates that suppressing or concealing one's true feelings is associated with both greater mental distress and physical negative consequences (Najmi & Wegner, 2008; Patel & Patel, 2019). In contrast, congruence involves awareness, openness, and connection, leading congruent communication to be an avenue in fostering healthier coping and emotional processing (Lee, 2002; Satir, 1996). Previous clinical study has already observed that improving congruence in communication can reduce stress levels. According to Lee and Merali (2022), clients in an addiction therapy who learned skills in congruent communication subsequently reported reduced stress alongside other improvements in couple relationship including work functioning and addiction symptoms. In conclusion, these two significant correlations provide initial support for the importance of congruent communication to psychological well-being.

Congruent Communication and Relational Factors. In the results, congruent communication was found to be not significantly correlated with family relationship dissatisfaction (p = .061) and ACEs (p = .456). The non-significant correlation between congruent communication and family relationship dissatisfaction suggests that these constructs,

while related in the term of relationship variables, may capture different aspects of inter-personal dynamics. Another explanation for the absence of significance may relate to statistical power and sample size. The observed correlation between congruent communication and family relationship dissatisfaction approached the conventional significance threshold (p = .061), suggesting that a larger sample may have yielded a statistically significant result. With only 179 participants, the present study had reduced sensitivity to detect small correlation coefficients as indicated by result (r = -.14, p = .061). This possibility highlights the importance of replicating these correlational analyses with larger sample size to more accurately determine the strength and reliability of this correlation.

And the absence of a significant correlation between congruent communication and ACEs may reflect the distal versus proximal nature of these constructs. ACEs represent early life adversity that may impair general family functioning, but congruent communication is a more dynamic, context-specific skill that can still develop in adulthood despite past adversity. This aligns with research suggesting that communication styles may not only shaped by early life experiences but can also be influenced by later experiences in life, even among individuals with adverse childhood histories (Lee, 2017; Mckelvey et al., 2012). In a similar study conducted by Hernandez (2021), ACEs was also found not to predict the development of maladaptive or adaptive communication styles. Therefore, the lack of a significant correlation may highlight the developmental flexibility of communication patterns, suggesting that while ACEs shape early vulnerabilities, congruent communication still remains open to growth across the lifespan.

Congruent Communication and IGD Severity. A novel contribution of this study is that we found a significant negative correlation between Congruent Communication scores and IGD severity (r = -.21, p = .006). In practical terms, participants who reported communicating

more congruently tended to have lower levels of problematic gaming. This is the first quantitative indication of such an association in the IGD literature, as congruent communication is a newly introduced construct in this IGD research domain. While direct comparisons are unavailable, the direction of this relationship is highly consistent with what is known in broader addiction research. Lee and Merali's (2022) qualitative study descriptively documented this tendency: the majority of clients with gambling or alcohol disorders were "avoidant in communication" and when distressed, "they withdrew and stuffed their thoughts and feelings" and this communication pattern was linked to depression and ongoing addiction. Their findings align with the idea that lacking congruence can exacerbate psychological pain and drive maladaptive coping like substance use or gaming.

The benefits of congruent communication have been demonstrated in addiction-focused Congruence Couple Therapy (CCT) that emphasizes authentic self-expression between partners (Lee, 2009). In a randomized trial, couples receiving CCT showed significant improvements in both relationship functioning and addiction outcomes, with clients reporting reduced substance use and gambling urges alongside better emotional coping (Lee et al., 2023). In analyses of this trial, clients who learned skills in "congruent communication" experienced concurrent reductions in stress and in their addictive behaviors. Thus, our finding that congruent communication correlates with lower IGD is in line with these therapeutic principles and findings in other addictive disorders, thus reinforcing the relationship between an inverse relationship of congruent communication and IGD.

Conclusion

All findings discussed across the first two themes demonstrate that IGD is not driven by any single determinant but rather emerges at the intersection of multiple psychological and

relational vulnerabilities. For mental health variables, both psychological distress and emotion dysregulation were significantly correlated with IGD severity, consistent with the literature identifying emotional vulnerabilities as core risk factors for behavioral addictions. For relational variables, ACEs showed a weak but significant positive correlation with IGD, while family relationship dissatisfaction was not directly associated with IGD in this sample. The third theme further highlighted that psychological and relational vulnerabilities are themselves interrelated, with ACEs, distress, dysregulation, and family relationship dissatisfaction forming a connected web of risks. And the fourth theme introduced congruent communication as a novel protective factor that was negatively correlated with IGD severity and indicators of poor mental health (i.e. higher emotion dysregulation and more psychological distress). These overlapping associations suggest that bivariate correlations alone cannot fully capture the multifactorial nature of IGD.

For this reason, the present study is propelled to move beyond pairwise associations and employ regression analysis to evaluate how these factors operate together. Multiple regression analysis allows us to examine the contribution of each variable while controlling others, thereby clarifying whether psychological distress, emotion dysregulation, ACEs, family relationship dissatisfaction, or congruent communication remain significant predictors once considered simultaneously. More importantly, this integrative step is helping to conceptualize IGD as a multifactorial disorder influenced by the convergence of emotional vulnerabilities, relational contexts, and communication processes.

Insights from Multiple Regression Analysis

Interpretation of Multiple Regression Analysis

The current findings with multiple regression analysis suggested IGD is potentially multifactorial disorder shaped by diverse psychological and relational processes rather than a

single dominant risk factor. The overall regression model was statistically significant, F (5, 173) = 3.575, p = .004, with an R^2 of .094 (adjusted R^2 = .067). This indicates that the combined set of predictors explained approximately 9.4% of the variance in IGD severity. Although this represents a modest proportion of explained variance, such effect sizes are common in behavioral addiction research, where outcomes are influenced by numerous psychological, relational, and contextual factors (Huang et al., 2024; Lee et al., 2022). In this sense, the model's explanatory power aligns with existing literature emphasizing the multifactorial nature of IGD (Paulus et al., 2018).

Among the predictors, congruent communication emerged as the only significant predictor (β = -.160, p = .039), suggesting that lower levels of congruent communication were associated with higher IGD severity. By contrast, ACEs (β = .145, p = .101), family relationship dissatisfaction (β = -.069, p = .441), emotion dysregulation (β = .077, p = .453), and psychological distress (β = .104, p = .314) did not reach significance as predictors in this model. The unique contribution of congruent communication suggests that relational communication patterns may play an under-recognized role in IGD risk, even when controlling for other well-studied psychosocial vulnerabilities.

Potential Reasons for Modest R^2 Value. Firstly, IGD is influenced by a wide range of biological (e.g., genetics, neurocognitive function), psychological (e.g., personality, coping styles), social (e.g., peer groups, cultural context), and environmental (e.g., game design, availability of technology) (Gao et al., 2022; Ropovik et al., 2023; Liu et al., 2024; Schneider et al., 2018; Na et al., 2017). The current model only included five predictors, so it is expected that the explained variance would fall within a modest range, since the multifactorial nature of IGD requires more variables to be integrated in predicting IGD severity.

Secondly, all predictors included are small-to-moderate correlates of IGD. When modeled together in the regression analysis, their unique contributions decrease because of shared variance among them (Crutzen & Peters, 2023; Nathans et al., 2012; Gunzler & Morris, 2015). This overlap likely contributed to the modest incremental prediction observed in the present study, which is reflected in the low R^2. To better separate shared and unique effects, future studies could use structural equation modeling with larger samples (Gunzler & Morris, 2015).

Thirdly, the present study employed a cross-sectional design which measures predictors and IGD at the same time. This cross-sectional design has limited inferential power and is less sensitive in capturing causal or developmental pathways, even though the multiple regression analysis is employed to calculate the predictive power (Georgeson et al., 2023; Reichenheim & Coutinho, 2010). Cross-sectional regression model may therefore underestimate their explanatory power, leading to a lower R^2 value. Longitudinal or structural equation modeling approaches are recommended in further studies, since they typically produce higher explained variance by capturing indirect effects (Gunzler & Morris, 2015).

Potential Reasons for Congruent Communication as Only Significant Predictor. Firstly, many of the other predictors in the model (ACEs, family relationship dissatisfaction, psychological distress, emotion dysregulation) are strongly inter-related, which might create shared variance. For example, ACEs were significantly correlated with both psychological distress (r = .410) and family relationship dissatisfaction (r =.513). When all variables are entered into the regression model, their predictive power might be overlapped. However, congruent communication captures a distinct and underexplored dimension that is less redundant with the other predictors, allowing it to emerge as a significant predictor even in a multivariate model.

Secondly, this result might be caused by differences between proximal and distal predictors. ACEs and family relationship dissatisfaction measure broader or distal influences, while psychological distress and emotion dysregulation reflect more general psychological states. Congruent communication, by contrast, is a more context-specific, relationally grounded skill that directly shapes how individuals manage stress in real time (Lee, 2009; Lee, 2002; Satir, 1996). Because addictions often developed as a maladaptive coping strategy, a communication variable tied to present moment coping may be more proximally relevant than distal adversities or diffuse emotional states (Lee, 2009). This nature of congruent communication could explain why it remained significant after controlling for the other variables.

IGD as Multifactorial Disorder

The regression analysis provides clear evidence that IGD is a multifactorial phenomenon rather than a single-variable condition. In our regression model, congruent communication emerged as the only significant predictor of IGD severity, while other variables were not significant. Taken together, these regression analysis results indicated the complexity of IGD etiology. In other words, IGD should be interpreted as a systemic issue that involves not only the individual gamer but also their relational context and communication patterns. This interpretation is reinforced by prior research on other behavioral addictions, including McComb et al. (2009) who indicated mainstream treatments have traditionally focused on the individual gambler's needs and often overlook the couple and family context. Our results echo this concern by demonstrating that a relational factor (i.e. congruent communication within relationships) had a predictive power for IGD outcomes.

Supporting Congruent Couple Therapy Model for IGD. The Congruent Couple Therapy (CCT) framework is developed based on Virginia Satir's family systems theory,

fostering congruent communication is central to healing addiction in a relational context (Lee & Rovers, 2008). According to Lee (2016), partners in distressed relationships often fall into dysfunctional "communication postures" (e.g. enmeshed, superior, avoidance) but moving toward congruent communication can break these cycles. Based on the CCT, the regression result that higher congruent communication predicted lower IGD severity suggested if individuals communicating in a more congruent manner, then the desire of using internet games as an addictive escape may diminish.

This finding resonates with CCT's core premise that addiction is frequently a symptom of underlying relational discord or unmet emotional needs in the couple or family system (Lee, 2009). For example, Lee (2009) conceptualized problem gambling as not only an individual habit but as deeply rooted within family dynamics, indicating that incongruent communication within couples can improve the need to escape into addictive behaviors. Compared with our study results, congruent communication's predictive role supports viewing IGD through a relational lens: incongruent communication and unresolved interpersonal tensions may be significant risk factors for IGD, whereas congruent communication may be the protective factor.

CCT Framework and Systemic Approach. CCT as a systemic, integrative approach to addiction treatment, which stands in contrast to traditional individual-focused models, provided a framework to interpret the present findings. To effectively treat addiction symptoms, CCT suggested that clients must address multiple interconnected dimensions of human experience (Lee, 2012; Lee et al., 2022). Specifically, this model integrated four domains: *intrapsychic* (the individual's internal emotions, thoughts, and coping), *interpersonal* (the communication and relationship patterns), *intergenerational* (family-origin influences and ACEs), and *universal/spiritual* (values, meanings, and broader existential or spiritual factors) (Lee, 2009). By

targeting all “four dimensions” simultaneously, CCT treats addiction as a relationally embedded disorder rather than an isolated illness within one person.

This systemic method and integrated perspective helped to explain our multiple regression results: congruent communication might encompass and involve several CCT dimensions in one construct. Its significance in predicting IGD supports the idea that addiction is a relational disorder, which is a view directly espoused by CCT theoretical foundation. The significance of whole regression model also lends empirical weight to CCT’s understanding that different dimensions have overlap predictive power toward addiction symptoms.

CCT vs. I-PACE and Traditional Addiction Models. Different from CCT, the Interaction of Person-Affect-Cognition-Execution (I-PACE) model is a contemporary theoretical model that describes the development of IGD and related behavioral addictions primarily in terms of individual-level variables (Brand et al., 2016). I-PACE model emphasizes how an individual’s predispositions (e.g. neurobiological or psychological constitutions), coping styles, cognitive biases, and executive functioning deficits interact to drive addictive internet use (Brand et al., 2016; Brand et al., 2019). In this model, external factors like social context are acknowledged as possible triggers or moderators, but the core mechanism centers on the person’s internal affect-regulation and reward-learning cycle (Brand et al., 2016; Lee et al., 2025). For example, I-PACE would explain IGD by how a person’s stress or depression triggers gaming as a coping strategy, which is reinforced via cognitive and neurobiological reward processes, potentially leading to a conditioned addiction cycle (Brand et al., 2016). Compared to CCT, this I-PACE model is multifaceted but still largely within the individual’s cognitive level and neurobiology.

Traditional addiction models (e.g. the cognitive-behavioral models) similarly tend to isolate addiction as something that happened only "within" the individual such as a brain disease, a learned maladaptive behavior, or a result of faulty thinking (Dong & Potenza, 2014). And their corresponding treatment often targets the individual through medication or individual therapy in isolation from their family system (Young & Brand, 2017; Scerri et al., 2019). By contrast, CCT situates addictive behavior in the relational context. CCT suggested that individual's addiction might serve a function in the family system, mediating conflict or providing an escape from an unsatisfying relationship pattern (Lee, 2009; McComb et al., 2009; Lee, 2015).

In conclusion, CCT suggested addiction including IGD is not simply a result of individual reward-processing, but potentially a symptom of distressed relational system. The significant role of congruent communication in our regression model bolsters this perspective, suggesting that the quality of interpersonal communication has a measurable predictive power on IGD outcomes, as something that individual-centric models might underappreciate. By combining CCT with our present study, CCT fills this gap by highlighting that healing the relationship is a potential significant pathway to healing the IGD.

Implications for Addiction Counselling

Recognizing IGD as a Multifactorial Disorder

The are four main contributions of the present study in the field of addiction counselling and IGD research. The first contribution is recognizing IGD as a multifactorial disorder, indicated that IGD is shaped by the intersection of psychological vulnerabilities, relational histories, and communication processes. The significant correlations between IGD severity and both psychological distress and emotion dysregulation highlight the importance of addressing mental health vulnerabilities in counselling interventions. Similarly, the observed associations

between ACEs, family relationship dissatisfaction, and mental well-being variables demonstrate that early adversity and current relational environments remain important background contexts influencing IGD risk. Counsellors should therefore avoid overly rely on individualistic models and balance to conceptualize IGD as the product of interacting systems, which is a perspective that calls for integrated assessment and intervention frameworks.

Introducing Congruent Communication as Novel Protector

The second and the most novel implication of this study is the finding that congruent communication was the only significant predictor of IGD severity in the regression analysis. This suggests that fostering communication where inner experiences align with external expression may directly buffer against maladaptive gaming behaviors (i.e. IGD severity). In practice, this means addiction counsellors should incorporate relational and communicative skills training as part of treatment. As shown in the present study and previous studies, congruent communication reduces reliance on avoidance-based coping strategies including excessive gaming behavior (Lee & Rovers, 2008; Lee, 2009). This insight expands the counselling toolkit by emphasizing relational processes as central protective factors, moving beyond symptom management toward strengthening interpersonal resilience.

Highlighting Trauma-Informed Intervention

The observed associations between ACEs, congruent communication, family relationship dissatisfaction, psychological distress, and emotion dysregulation suggest that individuals with IGD may also present with complex trauma histories and strained relational dynamics. For counselling practice, this finding calls for trauma-informed care that integrates both individual and systemic levels of intervention. Counsellors should recognize how past adversity may shape present vulnerabilities and how congruent communication can still be cultivated in adulthood

despite adverse childhood experiences. While ACEs remain a distal risk factor, our study suggests relational counselling can still empower clients to rewrite maladaptive interaction patterns and reduce reliance on gaming as escape.

Viewing IGD in Relational and Systemic Context

Finally, the predictive role of congruent communication provides empirical support for the principles of CCT (Lee, 2009; Lee & Rovers, 2008). For addiction counselling, the implication is clearly indicating interventions for IGD should not only address the gamer's psychological distress but also aim to improve the relational communication environment. With these relational focuses, counselling practice can align with systemic frameworks that view addiction as embedded within family dynamics rather than as an isolated individual disorder.

Limitations of the Present Study

Cross-sectional Design

The primary limitation of this study is cross-sectional design. Because all predictors were measured at a single time point, the analyses cannot establish causal inferences even we employed the multiple regression to examine predictive power. Consequently, it remains unclear whether factors such as ACEs operate as distal risk variables or whether congruent communication functions as a protective mechanism in the development of IGD over time. Longitudinal or prospective research designs are therefore required to clarify these temporal relationships and to evaluate the directionality of the observed associations.

Modest Sample Size and Statistical Power

A further limitation concerns the modest sample size of 179 participants. While this number was sufficient to conduct correlational and regression analyses, it may have constrained statistical power to detect small correlations. For example, the association between congruent

communication and family dissatisfaction approach but still miss conventional threshold for statistical significance (p = .061). With a larger sample, this relationship may have reached significance, thereby providing stronger evidence for the role of family dynamics. Moreover, the relatively limited sample size may have contributed to the finding that only congruent communication emerged as a significant predictor in the regression analysis, potentially underestimating the contributions of other theoretically relevant variables.

Reliance on Self-Report Measures

Another limitation of this study is the exclusive reliance on self-report questionnaires for data collection. This method raises concerns regarding response bias, including social desirability effects, recall inaccuracies, and subjective misinterpretation of items (Merten, 2025; Paulhus & Vazire, 2007). For example, participants' retrospective reporting of ACEs or psychological distress may have been shaped by current affective states or selective memory processes, which can undermine reliability (Reuben et al., 2016; Logan et al., 2008). Similarly, measures of family satisfaction and congruent communication are inherently subjective, reflecting more on participants' perceptions rather than pure objective indicators of relational dynamics. Such limitations are well-documented in psychological and behavioral research, where self-reported responses often diverge from observed behaviors or third-party evaluations (Paulhus & Vazire, 2007; Helleringer et al., 2019). To strengthen validity in future research, employing multi-method approaches (e.g. incorporating observational assessments, clinician-rated measures) would provide a more reliable understanding of these variables.

Convenience Sampling and Representation Bias

A further limitation of the present study is the demographic scope which only included Canadian emerging adults aged 18–29, a group highly relevant for IGD research given the

developmental salience of gaming behaviors in this stage of life (Wichstrøm et al., 2019; Andre et al., 2020). However, this narrow focus limits the generalizability of findings to other age groups, such as adolescents, who may be more vulnerable to gaming-related problems, or older adults, whose gaming patterns and associated psychosocial factors may differ substantially.

In addition, recruitment was conducted through an online panel (i.e. Leger). This approach may overrepresent individuals with reliable internet access, higher digital literacy, and greater motivation to participate in research for financial incentives, thereby potentially biasing the sample. As a result, the representativeness of the data is constrained, and the external validity of the findings across different cultural, geographic, or age-based populations is limited.

Measurement Limitation of Key Variables

Although this study employed well-validated instruments for most variables, two important measurement limitations warrant consideration. First, family relationship dissatisfaction was assessed using the Family Satisfaction Scale (FSS; Olson, 2011), but the variable was operationalized only as a global index of satisfaction. In other words, the measure captures overall satisfaction without addressing more specific relational processes that may be directly implicated in IGD, such as closeness, conflict resolution, cohesion, or attachment quality (Grajewski & Dragan, 2020). This broad operationalization may therefore lack the precision necessary to identify particular dimensions of family functioning most relevant to problematic gaming.

Second, while the Congruent Communication Scale (CCS) was adapted for use in this study, it is a newly developed instrument that remains under peer review. Its psychometric properties, particularly in the context of IGD and in communication patterns beyond couple relationships, are not yet firmly established. The absence of published validation raises questions

about the generalizability of the findings, and replication across more diverse samples will be needed to confirm its construct validity and applicability in addiction research.

Directions for Future Research

The present study makes important contributions to understanding correlations and relational predictor of IGD, yet it also highlights several areas that warrant further research. Future research should aim to extend, refine, and deepen these findings in at least following six directions.

Longitudinal and Developmental designs

Future studies are recommended to employ longitudinal designs to capture the developmental trajectory of IGD and its associated factors. Because the present study was cross-sectional, causal directions could not be inferred, limiting the ability to determine whether identified correlates act as antecedents, consequences, or reciprocal processes in relation to IGD. Longitudinal research would allow investigators to examine how ACEs, psychological distress, family relationship dissatisfaction, emotion dysregulation, and communication patterns influence the onset, persistence, escalation, or remission of IGD across time. Tracking participants over multiple times would also provide stronger evidence for temporal precedence, which is essential for clarifying risk and protective pathways.

Expanding sample diversity

Future research should also broaden the demographic scope beyond Canadian emerging adults to capture developmental and cultural variations in IGD. Expanding research into older age groups or adolescent groups would clarify whether relational and psychological vulnerabilities observed in emerging adults generalize across the lifespan. Additionally, cross-cultural research is essential for testing the generalizability of the predictors identified in this

study. The present findings emerged from a Western, mostly post-secondary educated sample (*n* = 124, 69.3%), which may not reflect the mental well-being, relational situations, and communication pattern in other cultural contexts. Investigating such differences through cross-cultural or multinational designs could refine theoretical models of IGD and inform culturally sensitive counselling interventions. Expanding to diverse samples will therefore enhance both the external validity of findings and the practical applicability of interventions across global populations.

SEM studies needed for disentangle indirect and overlapping effects

Given that the regression model in this study explained only a modest proportion of the variance in IGD severity (R^2 = .094), future research is recommended to employ more advanced analytic approaches such as structural equation modeling (SEM) to better account for the complexity of interrelationships among predictors. Different from multiple regression, SEM allows for the simultaneous estimation of direct and indirect effects, thereby clarifying mediated pathways (e.g., ACEs → emotion dysregulation → IGD) and testing whether variables such as psychological distress operate as latent variables (Alavifar et al., 2012; Li, 2011). Since our regression analysis indicated potential overlapping variance, SEM can help to capture both the overlapping variance across predictors and the contributions of each factor (Gunzler & Morris, 2015; Musil et al., 1998). To achieve these aims, larger and more diverse samples will be required, as SEM is more demanding in terms of statistical power and model stability (Wolf et al., 2013).

Develop interventions for significant others identified by client

The present findings highlight congruent communication as the only significant predictor of IGD severity, suggesting that interventions rooted in CCT may have broader applicability

beyond couple relationships. Although CCT was originally developed for relational and addiction intervention applied for couples counselling, participants in this study also identified parents, friends, and other non-spouse figures as communication partners (Lee & Merali, 2022; Lee et al., 2023). This indicates that congruent communication may serve as a protective factor across a wider range of relational contexts.

Future research should therefore explore whether CCT principles can be adapted to family, parent-child, or peer-based interventions, particularly since IGD often develops during adolescence and young adulthood when parental and peer influence is strongest (Wichstrøm et al., 2019; Biddle et al., 1980; Steinberg & Monahan, 2007). Expanding congruent communication into these contexts will not only broaden the utility of CCT but also align with systemic models of addiction counselling, which emphasize the interplay between individual vulnerabilities and relational environments.

More Studies are Needed for Practical Utilization

Another important future direction is the practical evaluation of congruent communication interventions in broader relational contexts through clinical research designs (e.g., randomized controlled trials, adaptive trials). While CCT has demonstrated efficacy in treating gambling and substance use disorders within couple settings, it remains unclear whether congruent communication training would yield comparable benefits when extended to other families, parent-child relationships, or peer groups for addressing IGD severity (Lee & Merali, 2022; Lee et al., 2023). Future clinical trials and treatment studies could directly compare communication-focused approaches with standard cognitive-behavioral or individually based IGD interventions, thereby clarifying whether congruent communication provides distinct clinical benefits in real-world counselling settings.

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APPENDIX A: INFORMED CONSENT

PARTICIPANT INFORMATION LETTER
Adverse Childhood Experiences and Internet Gaming Disorder: Role of Congruent Communication

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Invitation to Participate: You are invited to participate in this research study if you meet the following criteria:

- You are 18 to 29 years old.
- You are a Canadian citizen or currently residing in Canada.

To begin, you will complete a screening questionnaire, which will take approximately 2 minutes. This questionnaire will ask about your gaming habits. If your answers meet our requirements, you'll be invited to take the full survey, which takes about 15 to 18 minutes.

Purpose of the Study: From this research we wish to learn the relationship between adverse childhood experiences, congruent communication, and internet gaming disorder. Findings from this study will help advance knowledge of excessive gaming behaviour that could help both counselors and therapists to develop relationship-based prevention and intervention programs.

Participation: If you wish to participate in this study, please complete the screening questions. The survey should take you approximately 15-18 minutes to complete. Once you have completed the survey, you can submit your response by choose the "submit" button. If you proceed to the next section, you are agreeing to take part in this study as described in the consent form.

Risks: You may experience a degree of distress when answering some survey items. If this occurs, you are encouraged to connect with your counsellor for support. Other available

resources to reach out to include:

- Canada Suicide Prevention Service (CSPS): 1-833-456-4566
- Suicide Crisis Helpline: 988

Benefits: Findings from this study will allow you to reflect on your experiences and raise your self-awareness. It will also help us learn more about excessive gaming. This knowledge can help counselors and therapists create programs, which focus on building healthy relationships for prevention and support.

Voluntary Participation: You are under no obligation to participate. If you choose to participate, all answers will be kept confidential. You can withdraw from the survey at any time by closing your browser and not hitting the submit button. There will be no penalty. If you choose to quit the study after submitting your response, we won't be able to remove your answers. This is because we will not collect any personal information that could identify which responses are yours.

Compensation (or Incentives): If you complete the survey, you will receive 1,800 LEO points (equal to $1.80 CAD) as a reward. These points are part of the LEO (Leger Opinion) rewards program, which lets you collect points for taking part in research. You can redeem your points for cash, gift cards, or other rewards through the Leger platform. The points will be added to your LEO account after you successfully finish the survey. Only fully completed surveys will receive the reward.

Confidentiality and Anonymity: This survey is run through Qualtrics. While we do our best to keep your information private, there is always a small risk when information is sent and stored online. All data is encrypted both in transit and when stored on Qualtrics' servers, located within secure AWS data centers. For participant privacy, Qualtrics supports anonymous data collection and data masking features. No IP address will be collected while you are completing this survey. All collected data in this study will be anonymous, ensuring no responses can be matched with individuals' identities. You may view Qualtrics' privacy statement at https://www.qualtrics.com/privacy-statement/.

Data Storage: The information collected in this study will be stored on devices that are protected by a password. Your answers will not be linked to your name, email, or any other personal information. All collected data will be stored securely on a password protected computer of the researcher.

Information about the Study Results: The information from this study will be used for my graduate thesis. It may also be used in future research projects by me, my research supervisor, or members of my research committee. The findings of the study will be used for publications, reports, conferences, and presentations. However, the research findings will not be available to participants.

Moreover, we seek your consent to use your data from this study to answer other related research questions in the future. The anonymized data will be kept indefinitely. And may be used for related studies in the future.

Contact Information: If you have any questions about the study or would like to know the results, you can contact Ms. Yulin Chen at cheny@uleth.ca or +1 (587) 691-4089. This study has been checked and approved by the Health Research Ethics Board at the University of Alberta (Ethics ID: Pro00145684).

Conflict of Interest: The study is being sponsored by the researcher Ms. Yulin Chen. No potential conflicts of interest exist.

Completion and submission of the survey means your consent to participate.

APPENDIX B: DEMOGRAPHIC SURVEY

Please select a response for each item listed below.

1. **How old are you?**
   Answer: _____

2. **In which province or territory do you currently live?**
   - British Columbia
   - Alberta
   - Saskatchewan
   - Manitoba
   - Ontario
   - Quebec
   - New Brunswick
   - Nova Scotia
   - Prince Edward Island
   - Newfoundland and Labrador
   - Northwest Territories
   - Yukon
   - Nunavut
   - None, I do not currently live in Canada

3. **What is your gender?**
   - Male
   - Female
   - Transgender
   - Non-binary
   - Other, _____
   - Prefer not to disclose

4. **What is the highest level of education you have completed?**
   - Primary School
   - Secondary School
   - College Diploma
   - Bachelor's Degree
   - Post-graduate Degree

5. **How would you best describe your ethnic origin?**
   - North American Aboriginal origins
   - Other North American origins
   - Caribbean origins
   - Latin, Central and South American origins
   - European origins
   - African origins
   - Asian origins

- Oceanian origins
- Others, please describe:

6. **Do you struggle with addictive substance use or behaviors?**
    - Yes. Please specify: _____
    - No

7. **How many hours you spent weekly on digital games?**
   _____

8. **Which type of digital games you most frequently play?**
    - Action
    - Role-playing
    - Simulation
    - Strategy
    - Other: _____

9. **What device do you most frequently use for gaming?**
    - Game console
    - Personal computer
    - Smart Phone
    - Virtual Reality (VR) set
    - Other (please specify):

APPENDIX C: SURVERYS

Gaming Addiction Scale – 7 items (GAS-7)
(Lemmens et al., 2009)

1	2	3	4	5
Never	**Rarely**	**Sometimes**	**Often**	**Very Often**

How often during the last six months…

1. Have you thought all day long about playing a game?
2. Have you played longer than intended?
3. Have you played games to forget about real life?
4. Have others unsuccessfully tried to reduce your time spent on games?
5. Have you felt upset when you were unable to play?
6. Have you had arguments with others (e.g., family, friends) over your time spent on games?
7. Have you neglected important activities (e.g., school, work, sports) to play games?

Adverse Childhood Experiences Revised Questionnaire (ACE-Q)
(Felitti et al., 1998)

Instructions: Below is a list of 10 categories of Adverse Childhood Experiences (ACEs). From the list below, please place a checkmark next to each ACE category that you experienced prior to your 18th birthday. Then, please add up the number of categories of ACEs you experienced and put the total number at the bottom.

1. Did you feel that you didn't have enough to eat, had to wear dirty clothes, or had no one to protect or take care of you?
2. Did you lose a parent through divorce, abandonment, death, or other reason?
3. Did you live with anyone who was depressed, mentally ill, or attempted suicide?
4. Did you live with anyone who had a problem with drinking or using drugs, including prescription drugs?
5. Did your parents or adults in your home ever hit, punch, beat, or threaten to harm each other?
6. Did you live with anyone who went to jail or prison?
7. Did a parent or adult in your home ever swear at you, insult you, or put you down?
8. Did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way?
9. Did you feel that no one in your family loved you or thought you were special?
10. Did you experience unwanted sexual contact (such as fondling or oral/anal/vaginal intercourse/penetration)?

Difficulties in Emotion Regulation Scale – 16 item version (DERS-16)
(Bjureberg et al., 2017)

Please indicate how often the following statements apply to you by selecting the appropriate option for each item.

	Almost Never	Sometimes	About half the time	Most of the time	Almost always
I have difficulty making sense out of my feelings					
I am confused about how I feel					
When I am upset, I have difficulty getting work done					
When I am upset, I become out of control					
When I am upset, I believe that I will remain that way for a long time					
When I am upset, I believe that I'll end up feeling very depressed					
When I am upset, I have difficulty focusing on other things					
When I am upset, I feel out of control					
When I am upset, I feel ashamed with myself for feeling that way					
When I am upset, I feel like I am weak					
When I am upset, I have difficulty controlling my behaviours					
When I am upset, I believe that there is nothing I can do to make myself feel better					
When I am upset, I become irritated with myself for feeling that way					
When I am upset, I start to feel very bad about myself					
When I am upset, I have difficulty thinking about anything else					
When I am upset, my emotions feel overwhelming					

Family Satisfaction Scale (FSS)
(Olson, 2010)

1	2	3	4	5
Very Dissatisfied	**Somewhat Dissatisfied**	**Generally Satisfied**	**Very Satisfied**	**Extremely Satisfied**

How Satisfied are you with:

1. The degree of closeness between family members.
2. Your family's ability to cope with stress.
3. Your family's ability to be flexible.
4. Your family's ability to share positive experiences.
5. The quality of communication between family members.
6. Your family's ability to resolve conflicts.
7. The amount of time you spend together as a family.
8. The way problems are discussed.
9. The fairness of criticism in your family.
10. Family members' concern for each other.

Kessler Psychological Distress Scale (K6)
(Prochaska et al., 2012)

During the past month, about how often did you feel:	All of the time	Most of the time	Some of the time	A little of the time	None of the time
nervous?					
hopeless?					
restless or fidgety?					
so depressed that nothing could cheer you up?					
that everything was an effort?					
worthless?					

APPENDIX D: ETHICAL APPROVAL

Notification of Approval

Date:	March 24, 2025
Study ID:	Pro00145684
Principal Investigator:	Yulin Chen
Study Supervisor:	Bonnie Lee
Study Title:	Adverse Childhood Experiences and Internet Gaming Disorder: Role of Congruent Communication
Approval Expiry Date:	March 23, 2026

Thank you for submitting the above study to the Research Ethics Board 2. Your application has been reviewed and approved on behalf of the committee.

Approved Documents:

Recruitment Materials
Recruit Example.docx
Consent Forms
Consent_Form.docx
Questionnaires, Cover Letters, Surveys, Tests, Interview Scripts, etc.
Scales_ACE.docx
Protocol/Research Proposal
Research Proposal
Other Documents
Recruitment_Flow_Chart.docx

Any proposed changes to the study must be submitted to the REB for approval prior to implementation. A renewal report must be submitted next year prior to the expiry of this approval if your study still requires ethics approval. If you do not renew on or before the renewal expiry date, you will have to re-submit an ethics application.

Approval by the REB does not constitute authorization to initiate the conduct of this research. The Principal Investigator is responsible for ensuring required approvals from other involved organizations (e.g., University of Lethbridge, community organizations, school boards) are obtained, before the research begins.

Sincerely,

Ubaka Ogbogu, LLB, BL, LLM, SJD
Chair, Research Ethics Board 2

Note: This correspondence includes an electronic signature (validation and approval via an online system).