INTERNET GAMING DISORDER

THEORY, ASSESSMENT, TREATMENT, AND PREVENTION

DANIEL KING AND PAUL DELFABBRO

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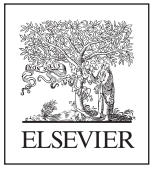

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Preface

This book was written with two goals in mind—simply, to be *informative* and *practical*. We wanted to bring together our knowledge about gaming and IGD in *one place*. While there have been some interesting books on "Internet addiction" and online phenomena, there was no specialty psychology or psychiatry book dedicated exclusively to gaming disorder. It was hoped that this book might fill this gap and summarize the current state-of-the-art in this area.

Each chapter was written primarily for an audience of researchers and clinicians, including readers at the student and more advanced levels. It was also intended to be accessible to many other important readers, including health professionals, policymakers, the gaming industry, teachers, parents, school students, and even gamers themselves. Many of the topics in this book have at least one key message for these groups.

With the DSM-5 now 5-years old, it is time to reflect on the research evidence and unresolved questions in relation to IGD. There are still many unknowns, particularly in relation to psychopathology and treatment, but the field continues to grow and innovate. The ever-changing nature of gaming has also meant that much research has often been outpaced by the technology itself. Gaming products are becoming more *socially integrated* via social media, *immersive* through devices like virtual reality, and *monetized* like gambling machines.

This book highlights the constant evolution of gaming and associated thinking about IGD. We aimed to provide a "wide-angle view" of the field—by critically summarizing the past and present status of IGD, its progression, and its future directions and challenges.

This book is unique in the sense that it combines theory and debate with practical and clinical applications. Although the field attracts strong interest from within and without the scientific community, there are very few IGD *research-practitioners*, particularly outside of East Asia. We have been fortunate to have met and collaborated with many such people and to have been involved in the recent WHO meetings on ICD-11 Gaming disorder. Learning from the shared experiences, understandings, and practical challenges faced by experts around the world has had a formative influence on the content and structure of this book.

This book acknowledges that the field has its opponents and has become quite divided in some areas. Some feel that IGD should not be in the DSM-5 because it may lead to a distorted view of all gaming as harmful in some way. Such critics have not managed referrals for gaming-related problems or confronted similar clinical realities. Helping those in need should be the *priority*, as it has been with the recognition of other addictive activities that many people enjoy, such as gambling and alcohol consumption.

The IGD field is composed of scholars who vary in their personal views and often disagree. This book navigates some of the field's internal politics and suggests some ways forward. While it is unclear at this stage whether or when IGD will attain full legitimacy in the DSM-5, this book outlines some new ways to assist efforts that support this goal.

This book is intended to be read as a *complete product*, and we strongly encourage this approach. However, we recognize that some sections will have more appeal or relevance than others. We have, thus, created each chapter as a standalone work, which means there will be at times some light reemphasis of material and revisiting of concepts to give sufficient context.

As a note on terminology, this book primarily uses the terms "gaming" and "game" to refer to video games. We do not use the term "Internet game" because this is not a popular usage, but this term does help to distinguish the intended meaning of IGD as referring to electronic gaming that typically occurs online. Some sections will use the term "video game" to avoid potential confusion with "gambling." Gambling is only ever referred to as "gambling" in this book. "Gaming disorder" will sometimes be used in lieu of IGD, when referring generally to the condition as broadly presented in the DSM-5 and ICD-11 classifications.

Thank you for reading this book and please feel free to share your thoughts and feedback, whether that is with us or your colleagues. In our experience, many of the most constructive and thought-provoking questions tend to come from "fresh eyes" or those from outside the field. Just as gamers collectively strategize and share their ideas about games, everyone tends to benefit from an open dialogue on IGD and related issues.

Daniel L. King, Paul H. Delfabbro
The University of Adelaide, Adelaide, Australia

Acknowledgments

I would like to acknowledge the many researchers and clinicians who have carried out their important work on IGD. I am particularly grateful for the pioneers who have worked hard to support the legitimacy of gaming disorder and the broader recognition of problem gaming as an issue of significance. This book could not do justice to all this great work. I am thankful to my wife and family for their support and tolerance of the long hours spent writing this work. The irony of my own increasing screen time was not lost on me. I am appreciative of colleagues who read drafts of chapters and provided feedback: Kim Le, Dan Loton, Ryan Balzan, Sally Gainsbury, Jeroen Lemmens, and Joel Billieux. I am grateful to the individuals and families who have shared their experiences in studies and clinical practice about the ways they were affected by IGD. Finally, this work was supported by a Discovery Early Career Researcher Award (DECRA) from the Australian Research Council (project DE170101198).

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About the authors

Daniel L. King, PhD, MPsych (Clin), is a senior research fellow and registered clinical psychologist in the School of Psychology at the University of Adelaide. He has authored more than 100 peer-reviewed papers on the topic of digital technology-based problems, with a focus on video gaming and simulated gambling activities. He was a 2016 recipient of an Australian Research Council Discovery Early Career Research Award (DECRA) on the topic of maladaptive gaming. He has received four national awards for research achievement, including the 2017 *Paul Bourke Award* from the Academy of the Social Sciences in Australia (ASSA). He was an invited attendee of the recent World Health Organization (WHO) meetings on the public health implications of gaming and inclusion of Gaming disorder in the ICD-11.

Paul H. Delfabbro, PhD, is a professor in Psychology and the deputy head of school in the School of Psychology at the University of Adelaide. He has published extensively in several areas, including the psychology of gambling, child protection, and child welfare and has been a regular advisor to State and Federal Government bodies. He has over 300 publications in these areas including over 200 national and international refereed journal articles. Over the last decade, he has conducted research into the nature of adolescent gambling, examined the psychology and social impacts of gambling, and conducted epidemiological and experimental studies and research into responsible gambling initiatives. His recent research interests have related to the interaction between technology, social media, and gambling as well as the relationship between clinical comorbidity and problem gambling.

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An introduction to gaming and IGD

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Chapter Outline

Introduction and overview

Games can influence people's lives. Throughout recorded history, the playing of games has been considered an essential and normal activity across the life-span. Through games, children learn to explore, to rehearse cognitive capacities, to release tension, and to bond with parents or affiliate with peers. Games can provide conditions that allow people to practice skills or act out roles of who they might want to be in real life. Moreover, the specific types of games that people choose to play can influence their personal development. For example, memory games can develop cognitive skills, social games can develop cooperation and communication skills, and adventure games can help people to confront their fears. People play what they like and get better at what they like by playing. Indeed, such is the psychological, social, and cultural importance of play that the lack of an ability to engage in play has often been seen as an early indicator of developmental disorders or delays or impairments later in life.

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Although games in general are seen to be beneficial activities, the massive popularity of *digital gaming* over the last few decades, particularly online social games, has given rise to a new kind of concern: people who play *too much*. Researchers and clinicians are increasingly recognizing that some people play video games to such an extent that it interferes with their family life, work, education, sleep, hobbies, and social relationships. For these individuals, gaming is no longer a beneficial activity, but one that causes harm. Such players do not play freely or for enjoyment. They are unable to stop or control their gaming behavior.

Studies of problematic gaming behavior have led to our current understanding of some gaming-related problems as a new type of *addiction*—more specifically, a "behavioral addiction." For some, an addiction to an activity rather than a type of substance may sound unconventional, if not questionable. However, as we will indicate in the chapters that follow, the available evidence shows that some vulnerable individuals are susceptible—due to factors including psychological predisposition, stress, risky environments, and the availability of gaming opportunities—to developing a *habitual and self-destructive* pattern of gaming. This behavior is characterized by many of the same features as disorders including gambling disorder and substance use disorder.

Individuals who engage in extremely problematic gaming behaviors, specifically those with an inability to self-regulate their gaming, are thought to have *Internet gaming disorder* (IGD). This classification is still new and not yet fully accepted in all nomenclatures. The Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5), recognizes IGD as a disorder that *may* be included sometime in the future as a legitimate disorder, but one that for now still requires "further study." As a related development, the upcoming International Classification of Diseases, 11th revision (ICD-11), is expected to include "Gaming Disorder"—this will mark the first time that gaming disorder is recognized as a diagnostic classification.

This chapter will begin with an introduction to video gaming products and technologies and will highlight the scope and global popularity of gaming. Recent innovations in gaming activities will then be discussed with reference to the potential implications for problem gaming and IGD. We will then highlight some of the common research approaches to the study of IGD and current understanding of the prevalence of gaming-related problems. This information is intended to "set the scene" for later chapters that will delve into the theoretical and practical issues associated with the empirical study and health response to IGD and related issues.

What are video games?

Many millions of people regularly play video games. For those unfamiliar with gaming, it may be helpful to know some of the basics about games, including the diversity of types and the types of experiences they can offer. Being acquainted with specific types of online games (e.g., *massively multiplayer online* [MMO] games) may be particularly useful for work with clients with IGD, because it may help, for example, in guiding screening questions and in making sense of client's behaviors. However,

one does not need to be a game "expert," because it is the *client's* understanding and experience that really matters in formulating relevant issues.

The term "video game" refers broadly to an *interactive* form of digital entertainment (Esposito, 2005). A game is designed by its developer to be played by a *player*. Typically, the player must use the game's *control scheme* (e.g., keyboard, controller, or motion sensors) to manipulate images on a visual display (e.g., computer monitor, television, or smartphone) to reach an outcome usually defined as success or failure (Bartle, 2004; Salen & Zimmerman, 2004). Broadly, the player may win or advance, or *lose*.

This technical definition does not, however, really capture the psychological experience of gaming, particularly in the case of modern gaming. Many modern games offer *unlimited* experiences of winning and losing, as well as complex narratives and characters, large open worlds to explore, and opportunities to socialize with other players (King, Delfabbro, & Griffiths, 2010). Games enable players to alter their state of mind, experience different emotions, satisfy psychological needs, or simply pass time and escape reality (Ryan, Rigby, & Przybylski, 2006). Games may provide an alternative place to socialize outside of work and play (Steinkuehler & Williams, 2006) or offer some people an alternative existence to the real world (Castronova, 2008).

Games and gaming experiences are highly varied. They can differ according to *genre* (e.g., shooting, role-playing, and strategy), *platforms* (e.g., personal computer, smartphone), *modes* (e.g., single-player, competing against other players), *online connectivity* (i.e., playing online or offline), and *objectives* (e.g., defeating an opponent using violence, persuasion, or stealth tactics). Players will often develop a preference for certain types of experiences, just as gamblers have preferences for a specific gambling activity. The term "gamer" should, therefore, be considered only as a loose term to connote a person with a stable interest in gaming. Gamers are a large heterogeneous population, and therefore, problematic gamers vary greatly too.

Gaming may be considered a "leisure" activity. However, some games appear to share much in common with a job or may blur the boundaries between work and play. Individuals dedicated to a game may play on a daily "9 to 5" basis and refer to their gaming activities as a kind of tedious obligation (Yee, 2006a). They may say they are *working on* a game rather than playing. We have interviewed individuals who have referred to gaming as like a *second job,* albeit one without any financial return to the player (King & Delfabbro, 2009).

Another important dimension to gaming is the player's attachment to virtual items, actions, and identities (King & Delfabbro, 2014). The virtual becomes "real enough." Many people care about and remember what they did in games (Molesworth & Watkins, 2016). In this way, gaming is part of a broader societal trend toward valuing *virtual* goods and services. Just as people value "likes," "clicks," and "swipes" on social media, some gamers value and keep records of their progression and status in games. Gaming is not always simply disposable; it can matter greatly to some people as a supplementary record of their life.

The above characteristics of games form part of the explanation of why they can become problematic—even addictive—for some people. Their *interactivity* grants the user a sense of mastery and achievement. Their *rewards* provide a sense of excitement or emotional release. Their *immersion* helps the user to forget about problems and

escape from distressing situations. Their *endlessness* enables any amount of time to be consumed by games. Their *work-like structure* gives the user a sense of purpose and routine. Their *virtual nature* gives users a sense of episodic progress and controllability. In short, they appear to offer users a *better reality.*

What are MMOs and MOBAs?

Massively multiplayer online (MMO) games are often implicated with IGD (Smahel, Blinka, & Ledabyl, 2008). MMO games are online games that can be played by many people simultaneously. Players often group together in teams or "guilds" to work toward shared goals.

The most popular type of MMO game is the MMO role-playing game (MMORPG) where the player creates a character (or "avatar") in a fantasy world or other setting (e.g., outer space) and completes tasks and "quests" either alone or with other players. The structure of these games is designed to be endless, such that even when players have completed the main objectives, there are often many alternative goals and forms of "horizontal" progression (e.g., customizing gear and building collections of items). These games are regularly updated with new content. An important characteristic of these games is their *persistent* world, meaning that the game cannot be paused and continues to "exist" when the player is not logged in. Popular examples of this type of game include *World of Warcraft* and *The Elder Scrolls Online.*

Another type of online multiplayer that bears noting is the multiplayer online battle arena (MOBA). This game type has become increasingly popular, particularly in eSports. A MOBA is a competitive game where two teams must compete in "real-time" (i.e., not taking turns) for in-game resources and defeat each other while defending territory. Gameplay is often fast-paced and features rounds, and therefore, the game often draws comparisons to sports like basketball or soccer. Popular examples of MOBAs include *League of Legends* and *DOTA 2.*

Other popular game types

Some other types of games warrant mention given their common reference in studies of IGD. For example, a "first-person shooter" (FPS) game refers to a game where the gameplay involves shooting enemies and other targets (usually with firearms). The player views the action from the perspective of the character (i.e., "first person"). FPS games may involve story and adventure elements, but these games are most known for being competitive, violent, and fast-paced. Many of the most popular online FPS games are played in teams and some are played within eSports (e.g., *Counterstrike: Global Offensive, Team Fortress 2,* and *Call of Duty).* "Third-person shooters" are similar in design to FPSs, but the player views the action from behind (or "over the shoulder") of the onscreen character.

Another popular type of game is the "strategy" game, a type of game which tends to involve a high degree of decision-making, resource management, and situational awareness.

The player may play against one or more other players or against a computer-generated opponent (i.e., referred to as a "bot," the "A.I.," or "the computer"). Strategy games are usually played either in *real-time* (i.e., all players actively play at all times, thereby favoring players who can make rapid decisions and actions) or in a *turn-based* format (i.e., players take it in turns, thereby favoring players with superior strategy and efficient move-making). Many strategy games are very popular online (e.g., *Starcraft 2, Civilization, Total War,* and *XCOM 2*), although MOBAs are perhaps the most typical "strategic" game for eSports.

"Simulation" games are a popular broad genre of games. The most common types of games in this category include *sports* simulation, such as various football games (e.g., *FIFA, Madden NFL*) and *racing* games (e.g., *Project CARS, Gran Turismo, Burnout*). The aim of these games is to offer players a sense of being involved in the corresponding real-world activity. However, these games differ greatly in terms of their level of realism and representation of their real-world counterpart (e.g., accurate physics and handling of a car). Games that offer more hyperreal or fantastical elements than realism tend to be referred to as having *arcade* elements.

It bears noting that many games within the above categories are increasingly adopting many of the design features that are seen in MMO games. This includes, for example, the addition of an "open world" into racing games; the addition of "role-playing" features in shooting games; and the addition of "item collection" features in sports games. This had led to an increasing *hybridization* of gaming products where the boundaries between games are no longer distinct. It is not uncommon, therefore, for games to have multiple descriptors for classification (e.g., *The Division* is an "open-world third-person shooter RPG").

Recent gaming innovations

Gaming has evolved since the days of bulky arcade machines in dim parlors (Kent, 2010). On one level, all games involve interactivity, strategy and skill, and making choices to determine outcomes—this will always be a feature of most digital gaming experiences.

However, there have been some recent innovations in gaming products and technologies that warrant mention. These developments further highlight the ways in which gaming can be so *time-consuming*, if not the *addictive potential* of gaming. Gaming developers are becoming increasingly savvy at implementing systems in games to keep players involved for longer and reducing time spent away from a game. Keeping individuals playing longer reduces the likelihood of the player migrating to other online games and ensures the game's population remains sufficiently high (i.e., virtual worlds remain populated) to attract new players.

Several major technological developments are related to widespread broadband services that have facilitated the rise of new social networks and digital distribution channels; the convergence of digital media platforms and services; and the shrinking form factor (i.e., physical size) of gaming hardware. These factors have led to gaming becoming increasingly *adaptable* to peoples' lives and *accessible* in any given situation. These factors also underlie the growing consumer adoption and use of gaming

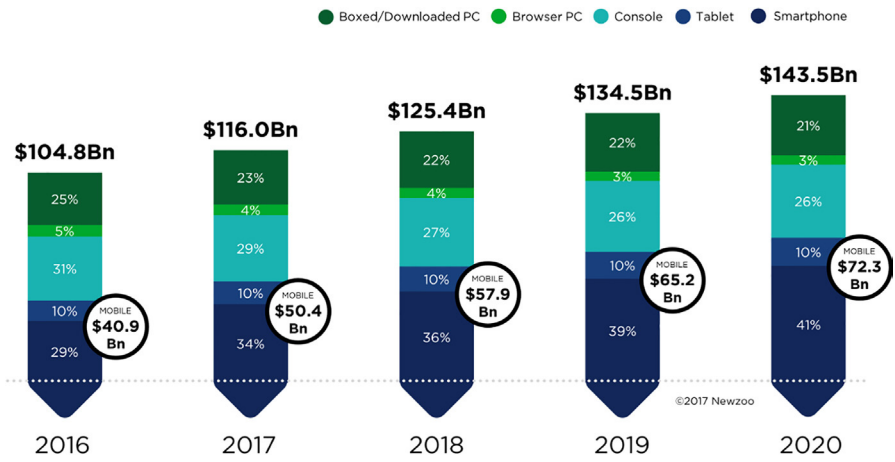

Fig. 1.1 The global games market (Newzoo Market Report).

products. Market projections indicate that the global games market will continue to grow steadily into the future (see Fig. 1.1). It is anticipated that mobile or smartphone gaming (i.e., the most adaptable/accessible market), in particular, will increase its share of the market from 32% to 41% over the next 3 years, whereas other markets will reduce or remain relatively constant.

While the "casual" market (i.e., players of low-cost smartphone-based games) generates the highest total revenue, this may be due to its much larger user base, which is predominantly composed of individuals who play for short periods (<30 min/day) and who spend small amounts of money. Fig. 1.2 shows that the playing population in Australia, for example, is quite demographically diverse, with both males and females of all ages reporting frequent use of games. Many of these players would not self-identify as being "gamers" in the typical sense.

Fig. 1.2 highlights that males aged 15–24 years tend to spend more time per day playing games than any other demographic. Males' gaming behaviors appear to become more similar to females after the age of 40–45 years, which may suggest an "aging out" effect over a 20-year period. However, it should be cautioned that this data was only cross sectional. One must also take into account that these frequencies do not distinguish the type of gaming activity.

Fig. 1.2 shows that there are some individuals aged over 75 years who play games daily. However, there are some caveats. First, Brand et al. (2017) reported that only 43% of individuals over 65 years in their sample played games. Second, the study recruited from a Nielsen Your Voice Panel (i.e., consumers who give feedback on products and service), which may include more individuals who use electronic products than those recruited from other sources. Third, the "daily" average implies that all of the participants are playing "daily," when in fact their usage is being averaged to a daily rate. Nevertheless, the data show that gaming is *not* just a popular pastime for young males, particularly when considering mobile gaming.

Mobile gaming attracts a large "casual" audience; however, smartphone gamers should not necessarily be assumed to experience fewer gaming-related problems. This

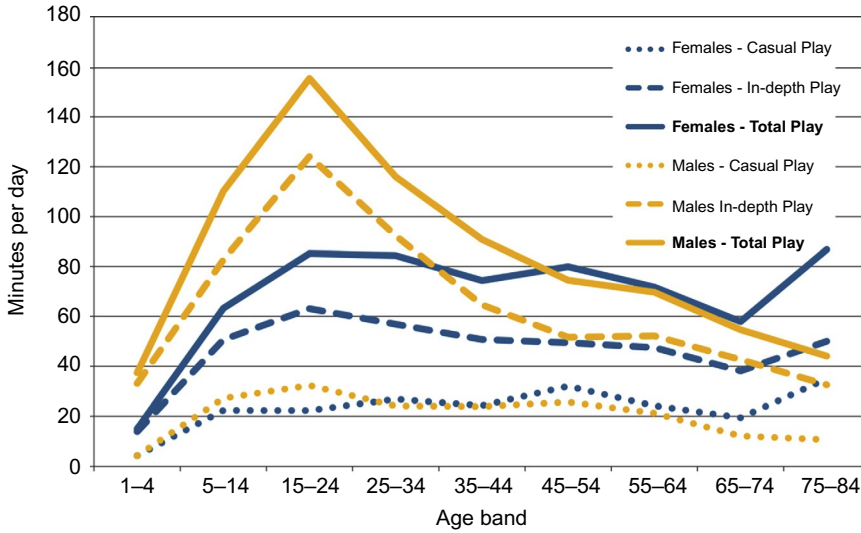

Fig. 1.2 Average daily gaming activity in Australia (Brand, Todhunter, & Jervis, 2017).

population has received less research attention from an IGD perspective. Research on problem gaming has tended to concentrate on platforms such as the home personal computer and consoles because these systems enable more sophisticated or elaborate online games (e.g., massively multiplayer online [MMO] games and shooters) associated with persistent gaming and resultant problems. It is possible that smartphone gaming may be an adjunctive activity for problematic gamers at times when they are unable to play on their preferred platform.

Games as a "service"

In the past, most games were purchased on a stand-alone basis. One purchased a cartridge, disk, or piece of software and one would be free to use it *in perpetuity*. By contrast, many online gaming services (e.g., *Xbox Live, PlayStation Plus*) and digital distribution now offer products on a service basis. This refers to games where: (1) the player must have an online connection in order to play due to the requirement of connecting to an external server that processes the game's operations; and (2) games being frequently updated or otherwise modified via online updates (e.g., patches, "hotfixes") resulting in new game-related parameters (e.g., adjustments to game difficulty, reward frequency, pace of action, or responsiveness of controls).

One example of games as a service is the online subscription-based game (i.e., a game where the player pays a monthly fee to play). The main implication of this model is that developers can introduce major changes to their games in response to players' behaviors and preferences. For example, if players tend to find a game event too difficult or too easy, this event be modified accordingly. Similarly, if players identify unexpectedly rewarding ways to play (e.g., "exploits") that yield too many in-game items or

they pass through game content too quickly, the developers may adjust these systems to prevent these "efficient" behaviors. Service-based games enable developers to have more control over game content to prevent players from "completing" the game too quickly and moving on to another gaming product.

The overall effect is that these games are *constantly changing*, which keeps players involved (Männikkö, Billieux, Nordström, Koivisto, & Kääriäinen, 2017). Service games are better equipped than other games to offer novelty and surprise to engage and retain their player base. As the developer of the game known as *PUBG* announced recently, "We see PUBG as an endlessly evolving online product" (Batchelor, 2018). Because the game changes to some extent each time it is updated, some players may feel the need to play regularly to avoid a fear of missing out (Przybylski, Murayama, DeHaan, & Gladwell, 2013). By design, service games cannot be completed, which may be problematic for some vulnerable individuals motivated to play for achievement and collection purposes.

Monetization schemes

A development related to "games as a service" has been the advent of sophisticated monetization features in games. Some games rely on a traditional revenue model where the player pays a fixed price to own or play the game for a set period. A second type of revenue model, usually seen in games on mobile platforms and sometimes referred to as *free-to-play*, does not require the player to spend any money to play, but the game offers small optional purchases (i.e., "microtransactions"). Such purchases may include cosmetic differences or items that enable certain advantages to gameplay (i.e., *pay-to-win*).

Free-to-play games are extraordinarily popular. Some recent data have suggested that 1 in 3 people *globally* play free-to-play games and that these games generated more than $82 billion dollars in revenue in 2017 (SuperData Research, 2017). In addition, consumers spent $14 billion more on mobile games in 2017 than in 2016. As one example, the game *Candy Crush* was recently estimated to have a daily revenue of more than $2 million, which is about four times higher than its recorded daily revenue in 2013 (Thinkgaming, 2017).

Recently, some games have introduced monetization schemes whereby the player can spend real money on "loot boxes." A loot box is an in-game reward delivery system (usually represented as a chest or crate that is opened) that gives the player a random selection of items, which may include cosmetic items or items that offer a competitive advantage. Loot boxes are similar in nature to gambling slot machines in that they require no skill and deliver a randomly determined outcome (i.e., prize). Some games enable and encourage players to spend money to purchase loot boxes to gain more opportunities to acquire in-game items.

Some monetization schemes are arguably quite *exploitative* of players in the sense that players are typically not informed of the odds of receiving desired items from loot boxes. Some games (e.g., *Star Wars Battlefront 2, Destiny* 2) have been purposefully designed to encourage players, many of whom will be children and adolescents, to spend money on loot boxes rather than acquire these rewards through investing time in the game.

In conjunction with monetized loot boxes and other microtransactions, games such as *Destiny 2* have been noted by players to have employed *predatory* tactics such as: (1) "throttling" (i.e., hindering) the amount of points that can be acquired through normal play toward earning loot boxes to instead encourage players to spend money on these boxes; (2) requiring that players always redeem non-loot box rewards via an in-game marketplace that sells loot boxes to ensure maximum exposure to these offers; and (3) adjusting the game's reward system so that loot boxes contain the majority of "rare" (i.e., more desirable) rewards to create demand for monetized rewards. Game progression in such games, therefore, becomes less driven by player skill or strategy, and more about spending money, making these games more like gambling machines.

Some vulnerable players, including adolescents with access to a parent's credit card, may be susceptible to overspending on these schemes (King, Russell, Gainsbury, Delfabbro, & Hing, 2016). Purchases on loot boxes and other microtransactions are not usually refundable, and game developers do not include countermeasures or other safeguards to prevent overspending. There is growing anecdotal evidence and clinical case reports (e.g., recent conference presentations) that have highlighted the risks of these schemes for some players (Gainsbury, King, Russell, Delfabbro, & Hing, 2017; Kalhour & Ng, 2016; Teichert, Gainsbury, & Mühlbach, 2017). A news story by Gach (2017), for example, reported on a 19-year old who had spent over $17,000 on loot boxes across three different games.

eSports and streaming

Gaming has become a major cultural phenomenon in many countries. This is particularly highlighted by the rise of *eSports*, or professional leagues and tournaments where players compete against each other, individually or in teams, for prize money. These events are especially popular in countries such as South Korea and China. In 2017, eSports generated $756 million in revenue and is projected to become a billion dollar business in 2018 (SuperData Research, 2018). Popular games including *League of Legends* and *Overwatch* attract audiences that fill large stadiums and have had over 250 million online viewers in 2017. Many of the top players and teams are regarded as celebrities.

There also appears to be large monetary incentives in eSports for players. The largest overall prize pool in eSports was *The International 2017* for the game *DOTA 2* with a US$24 million dollar total prize pool for teams. The winning team also received a physical trophy forged out of bronze and silver, called the *Aegis of Champions,* crafted by Weta Workshop, the special effects company behind the *Lord of the Rings* films. *DOTA 2* is also the top-ranked game for total prize money, having awarded over $133 million across 880 tournaments and 2335 players (Source: https://www.esportsearnings.com/games). While these revenues appear to be high, it bears noting that the average salary of most players is thought to be relatively low, like many other sports, and depends heavily on sponsorship deals and player management.

A related development has been the rise of online *streaming* of gaming activities as a form of entertainment similar to television broadcasting. Many millions of people

watch others play games on online channels such as *Twitch* and *YouTube Gaming*. Some of this broadcasting may be a live feed of the player commentating while playing in a recording studio, and other video content may be prerecorded and edited like a conventional TV program. One such popular streamer, Felix Kjellberg (or *PewDiePie*), has made a full-time career out of this type of programming and has an estimated net worth that exceeds $10 million. There are many "youtubers" and "streamers" who attempt to emulate his level of success.

Together, these developments show that there is a *massive* consumer demand, particularly among younger audiences, for *passively* "watching" gaming as entertainment, either as a competitive sport or in formats that appear similar to cooking shows, infomercials, comedy skits, news and DIY programs, and voyeuristic forms of reality TV.

An implication for IGD is that these developments may make it difficult for some people to avoid cues and promotions related to gaming, because this content is so pervasive and accessible online. Further, some viewers may develop unrealistic goals and expectations around gaming based on the activities of people who play on a full-time basis. They may justify extreme gaming behavior on the basis that it is consistent with what others are doing online. Streaming content may normalize gaming as a lifestyle and provide avenues for individuals without real-world friends to feel socially connected with online personalities (Gandolfi, 2016). Another recent concern has been the promotion of gambling to minors through eSports, including gambling using monetized gaming items (e.g., *skins*) (Macey & Hamari, 2018).

Virtual reality

Games are usually displayed on a visual display such as a television or computer monitor. Virtual reality (VR) refers to the use of a helmet device that contains a screen that simulates an interactive three-dimensional image or environment. VR creates a gaming experience that is generally more immersive than other standard gaming displays.

At this stage, VR comprises a relatively small gaming market, due to the accessibility costs (i.e., requirement of additional equipment) and fewer games. VR games tend to be designed as shorter experiences (e.g., 45–60 min), given that VR can be physically uncomfortable or nauseating for players over longer periods. Nevertheless, VR gaming is growing slowly in popularity as the technology becomes more affordable and as popular titles on other platforms are adapted to the format. According to SuperData Research (2017), decreasing prices on VR headsets and software led to a 37% increase in VR revenue in 2017. It is possible that increasing consumer demand for VR pornography may also increase VR game uptake as a by-product.

Research has not yet investigated links between VR and problematic gaming. As this technology advances and supports software that offers more complex gaming experiences (e.g., MMO games), some vulnerable players may develop problems associated with excessive use. VR has demonstrated potential in offering experiences that enable the user to "disconnect" from reality (i.e., lose awareness of surroundings, disengage from others in real world).

Augmented reality

Augmented reality (AR) games are games that enable players to experience digital gameplay in a real-world environment. The gaming device superimposes a computer-generated image on a user's onscreen view of the real world (via an inbuilt camera), thus providing a *composite* view. Currently, these types of games are most common on smartphones, given their camera, GPS, and ease of portability while moving.

The most well-known AR game is *Pokémon Go*, which released in 2016 and had an estimated 65 million monthly active users in 2017 (Tassi, 2017). AR gaming may become even more popular as smartphone technology improves (e.g., better battery life and mobile connectivity) and a wider range of AR software becomes available. AR games may also be more incorporated into wearable technologies, such as "smart-glasses" (i.e., online-enabled computer glasses or lenses that add information to modify what the wearer sees).

Social media and smartphone integration

Online connectivity has enabled many types of games to integrate with social media platforms (e.g., *Facebook*), usually to log player progress, upload in-game video recording or other media, or invite other people to play.

Social media integration enables players to share their game activities with others beyond their social network of friends who play games. Data sharing may also enable developers to track the activities of the player and their interests in other activities, including preferences for other brands and products. Companies, including game developers, can then tailor their game-related advertising and messages to different segments of their player base. They may also use this information about players to modify their game content offerings.

An implication for IGD relates to players' increased ability to keep track of in-game activities and progress via other online devices, such as smartphones. This may include monitoring other players, accessing some of the features of a game (e.g., character inventory), or making purchases via the in-game marketplace through an app. Players preoccupied with gaming are, therefore, able to access their personal gaming content remotely (e.g., at work or school). Problem gaming may, therefore, include life interference at times when the player is "not playing" due to the excessive use of associated devices that *support* gaming.

Portability

Gaming hardware is becoming more powerful and more *compact*. This has led to the creation of a mass market for portable or "handheld" gaming devices. This innovation has led to gaming becoming much more accessible, allowing players to conveniently *play anywhere* (e.g., any room of the house, public transport, at work). Smartphones and tablets also increasingly support many types of games, which has enabled game developers to reach individuals who would not typically purchase a gaming-only device.

Portable gaming is arguably the most prevalent type of gaming, based on sales data. The Nintendo *Switch* console, for example, has sold almost 15 million units in its first year of release (Kuchera, 2018), making it one of the most popular recent-generation gaming devices. Portable gaming options offer gaming enthusiasts and problem gamers an adjunctive gaming activity at times when they cannot use a device at home or elsewhere (e.g., Internet café).

Research has tended to focus on problem gaming among users of nonportable gaming devices (i.e., PC gaming and home console games) (Elliott, Golub, Ream, & Dunlap, 2012; King, Delfabbro, Zwaans, & Kaptsis, 2013), given that individuals who neglect their life responsibilities usually do not require the convenience of a device that can be carried with them to different locations. These individuals may tend to have more sophisticated home gaming set ups where they spend most of their time.

Nevertheless, some recent studies have highlighted problematic gaming can often occur on portable devices. For example, a study of 1556 students by Lee and Kim (2017) reported that "casual" gaming among males was a significant predictor of gaming problems. Similarly, Liu, Lin, Pan, and Lin (2016) reported that adolescent smartphone users who played games scored significantly higher on a measure of Internet addiction than nongamers.

Research methodologies for IGD

The scientific understanding of IGD has been shaped by the methods used to study the phenomenon. The study of problematic gaming has historically involved a limited range of methodologies. The first studies of problem gaming in the 1980s and 90s were generally conducted in arcade machine parlors (Egli & Meyers, 1984; Griffiths, 1991; McClure & Mears, 1984) and involved basic surveys and observational methods. The main population under study was adolescents, with a focus on those who were missing school to play games. Surveys tended to include questions modified from problem gambling studies (e.g., Fisher, 1995; Gupta & Derevensky, 1996). These smaller exploratory approaches were employed because they were relatively inexpensive (and there was no major funding in this area), and the concept of problematic gaming was still being defined.

The rise of online gaming in the 2000s led to a major shift in the way people played games, and the research methods used to study them. More individuals were playing at home and online. Players were engaged with others online via gaming discussion boards and other online meeting places. Therefore, studies of problem gaming began advertising surveys on these websites to recruit volunteers from online gaming communities (Griffiths, 2010; Wood, Griffiths, & Eatough, 2004). A common limitation of these studies was the reliance on self-selected samples, thereby making it difficult to generalize to the broader population (King, Haagsma, Delfabbro, Gradisar, & Griffiths, 2013). However, these studies were often able to obtain very large samples and helped to understand the more enthusiastic and conscientious segments of the gaming population (Yee, 2006b).

A parallel development was epidemiological approaches to the study of problem gaming (Kuss, Griffiths, Karila, & Billieux, 2014). Studies throughout Europe and East Asia examined the prevalence of problem gaming among high school students (Gentile, 2009; Siomos, Dafouli, Braimiotis, Mouzas, & Angelopoulos, 2008; Yen et al., 2008). Some of these studies began to employ randomized sampling and longitudinal designs, as well as a broader range of psychological variables for comparison, which was a major improvement on past designs. The study of young adults became more common too. Many researchers developed new screening tools for problem gaming, although many of these tools were quite similar in their theoretical orientation and items (King, Haagsma, et al., 2013).

The identification of gaming problems and growing public concerns about screen time in young people led to an increased focus on interventions in some regions. Treatment studies for Internet addiction, which often referred specifically to gaming behaviors, became much more common around 2007 (King, Delfabbro, and Griffiths, 2011; King, Delfabbro, Griffiths, & Gradisar, 2011). Many of these early studies lacked compliance with gold standards for clinical trials, but they provided the foundation for more rigorous work, particularly studies of cognitive-behavioral therapy (Du, Jiang, & Vance, 2010; Jäger et al., 2012; Wölfling, Beutel, Dreier, & Müller, 2014). Some countries established treatment centers for Internet-related disorders, which supported efforts to develop standardized approaches (King et al., 2017).

The recognition of IGD in the DSM-5 in 2013 was a turning point because it provided some additional legitimacy to the field. This recognition may have stimulated more research specifically in the areas of psychiatry and neuroscience (Brand, Young, & Laier, 2014). Recently, there have been many IGD neuroimaging studies, particularly in China and South Korea (i.e., where individuals with IGD are treated in hospital settings), which have identified functional brain changes due to IGD (Ko, Liu, & Yen, 2015). This work has complemented (i.e., triangulated) some of the self-report survey studies and case reports of IGD over the previous few decades.

Research approaches to IGD will continue to be consolidated and refined, and there will be more work in new and diverse areas related to the evolving status of gaming. Broadly, future work on IGD may be expected to:

(1) incorporate new approaches that reduce the reliance on self-report (e.g., behavioral tracking, external raters);
(2) investigate a wider range of psychological concepts and health-related variables in connection to IGD;
(3) employ more general population and clinical samples, rather than student samples;
(4) examine IGD in terms of its diversity of games and platforms;
(5) conduct more rigorous treatment studies; and.
(6) test theoretical models that unite concepts from multiple disciplines.

With its growing recognition in psychiatry and related fields, IGD may be included in studies of other addictive behaviors (e.g., gambling disorder) and mental health across a range of populations. IGD may also become incorporated into more teaching curricula, for example, at high school and university levels, and thus, taught alongside other research approaches, which may help facilitate new avenues to investigate the topic.

Prevalence of problem gaming and IGD

The study of the prevalence of problematic gaming and IGD has not been straightforward because much of the research has employed weak sampling and varied measurement (Mihara & Higuchi, 2017). The main sampling limitation of surveys has been the use of *self-selected* samples, which is likely to attract more individuals with gaming-related problems who view the study as being personally relevant to them. Measurement of IGD and problem gaming has been compromised by the use of screening items that do not capture *harmful* use. These two caveats have arguably led to many studies reporting *inflated* prevalence rates.

There have been some empirically robust studies of IGD prevalence, particularly of older adolescents. For example, Rehbein, Kliem, Baier, Mößle, and Petry (2015) conducted a large-scale, state-representative school survey of 11,003 adolescents (aged 13–18 years) using the DSM-5 criteria for IGD. They reported that 1.16% of respondents may be classified with IGD using the DSM recommendations (i.e., meeting 5 out of 9 criteria). Individuals with IGD played games for longer periods, skipped school more often, had lower school grades, and had sleep problems.

Another study by Müller et al. (2015) assessed the prevalence and correlates of IGD in seven European countries based on a representative sample of 12,938 adolescents between 14 and 17 years. The authors reported that 1.6% of the sample met full criteria for IGD, with a further 5.1% at risk for IGD by meeting up to four criteria. IGD was associated with psychopathological symptoms, including aggressive behavior and social problems.

High-quality studies have reported comparable figures, including: 0.6% in a sample of 816 Norwegian adolescents (Mentzoni et al., 2011); between 0.3% and 1.0% in four international cohorts totaling 18,932 people (Przybylski, Weinstein, & Murayama, 2016); 2.0% in a sample of 1718 Chinese adolescents (Mak et al., 2014); 1.3% in a nationally representative panel of 902 Dutch gamers (Haagsma, Pieterse, & Peters, 2012); 1.5% of Dutch adolescents aged 13–16 years olds (Van Rooij, Schoenmakers, Vermulst, Van Den Eijnden, & Van De Mheen, 2011); and 1.8% in a sample of 1287 Australian adolescents (King, Delfabbro, et al., 2013).

A meta-analysis by Ferguson, Coulson, and Barnett (2011) examined 33 published studies and doctoral dissertations. Although the authors noted that spuriously high rates were reported in some of these studies, they concluded that the most precise measures produced an overall prevalence rate of 3.1%. It bears noting that this analysis preceded the inclusion of IGD in the DSM-5.

More recently, Mihara and Higuchi (2017) examined the prevalence of IGD across 37 cross-sectional and 13 longitudinal studies. The main findings of their review was the prevalence of IGD ranged from 0.7% to 27.5%. IGD prevalence was higher among males than females in the vast majority of studies and tended to be higher among younger rather than older people. Geographical region made little difference to prevalence. Longitudinal data indicated that the course of IGD was more stable in adolescents than in adults.

The best available evidence suggests, overall, that the prevalence of IGD is around 1% and is more common among young males. This figure is consistent with more conservative estimates of other addictive behaviors, including gambling disorder (Williams, Volberg, & Stevens, 2012).

Why does IGD matter?

IGD is important because it can contribute to mental health problems in people of all ages and cultural backgrounds. IGD is an issue that has received a lot of attention in some countries where mental health is often more of a taboo subject—it bridges the cultural divide. The negative consequences of excessive gaming indicate that IGD should be a mental and physical health research priority in line with other addictive behaviors. Many of the negative effects of excessive gaming can have similarities to other mental health conditions and will warrant attention in treatment. Some of the known negative consequences of IGD include:

- Mood changes, including irritability, anger, and boredom
- Disturbed sleep-wake cycle and poor sleep quality
- Depression and anxiety, and suicide risk
- Physical discomfort and pain issues
- Poor general health
- Poor diet and caffeine overconsumption
- Loss of real-world friendships and social isolation
- Conflict with family members
- Separation and divorce
- Major disruption to work and productivity
- School absenteeism and dropout
- Financial insecurity

Addressing the skill gap in IGD care

While there is growing recognition of problem gaming and IGD among health professionals, there are relatively limited resources to support the demand for specialized services. Referrals for problem gaming will be made to doctors, psychiatrists, and other health professionals, but they will often feel uncertain in how to respond effectively. The lack of treatment options may lead to cases worsening, including the development of other severe psychological problems and compounding socioeconomic disadvantage. For example, individuals with IGD who are not treated at the age of 16 years may fail to complete school or develop work experiences, which may have significant flow-on effects into young adulthood.

Many health professionals are aware of IGD, but are unsure of what to do. A study by Dullur and Hay (2017) recently surveyed 289 members of the Royal Australia and New Zealand College of Psychiatrists (RANZCP) about their health literacy of problem gaming and IGD. They reported that 93% of the sample were familiar with the condition and associated issues, and 35% had encountered IGD in their general practice. However, only 16% of respondents felt that they were confident in managing clients with IGD. Of concern, these findings were consistent with a case study of IGD by Allison, von Wahlde, Shockley, and Gabbard (2006) published over a decade ago. The multidisciplinary team responsible for managing a young adult patient with severe IGD reported that there was uncertainty regarding best practice and intervention.

Responding to IGD effectively has been difficult due to the lack of quality material to consult for guidance, such as manualized treatment protocols supported by controlled treatment studies (King et al., 2017). The discrepancy or "gap" between what vulnerable people *need* and what many regions' services can *offer* underlines the need for more resources for IGD and the negative public health consequences of inaction in this area.

Aim and coverage of this book

This book aims to summarize the current state-of-the-art on IGD and problem gaming. Each chapter presents material that combines theory and debate with practical and clinical applications. This book was written primarily for the *research-practitioner* with a background in psychology or psychiatry, but this work should be useful for health professionals, policymakers, the gaming industry, teachers, parents, school students, and gamers themselves.

The coverage of this book includes the *theoretical* bases of problem gaming and IGD, along with explanations of the specific risk and protective factors for IGD. The unique cognitive aspects of IGD, as well as its cognitive similarities to other addictive disorders, will be described. This book emphasizes that IGD is an addictive disorder characterized by impaired control and functional impairment, with some unique features and different subtypes of users.

The second half of the book has a stronger *practical* focus. Topics will include screening and assessment in the context of clinical practice and research and the components of case formulation of clients with IGD. The global evidence on treatment, prevention, and harm reduction strategies is presented with practical examples. Current knowledge is still developing in these areas, but cognitive-behavioral therapy and school prevention programs appear to be promising measures to address IGD and problem gaming.

The final section of this book outlines some ways for the field of IGD to continue to grow and improve as a scientific discipline. This includes discussion of specific areas of research where considerable gains in understanding and responding to IGD may be achieved. There are many challenges ahead, but also many reasons to be optimistic about the future of this field.

Summary: The procession of simulacra

Video gaming is a multibillion dollar global industry that is projected to continue to grow. The popularity of online gaming reflects a major cultural shift in leisure and recreation preferences for screen-based entertainment over other pastimes. Individuals of all ages play games daily for enjoyment and socialization. Some people report finding deeper personal satisfaction and meaning in their virtual experiences than in their real-world lives.

In this context, there is growing recognition of the harms related to unrestricted screen time, particularly in younger people. Gaming provides an endless and constantly changing simulacrum of reality (see Baudrillard, 1994). A procession of new gaming products and innovative technologies continually enters the consumer market. Many new games include features that make them more immersive, socially integrated, and monetized than those before them. For some vulnerable players, these games are highly time-consuming and addictive.

These developments have led to the recognition of *Internet gaming disorder*—a disorder characterized by persistent gaming and functional impairment in multiple areas of life. The two most influential diagnostic systems for mental disorders, the DSM-5 and ICD-11, now recognize gaming as a disorder and advocate for the need to better understand this condition.

Problem gaming and IGD can affect individuals in significant ways. Some of the documented negative impacts of excessive gaming include increased levels of anxiety and depression, sleep disruption, school disconnection, unemployment, and marriage breakdown. Analyses of prevalence data suggest that about 2% of the population may meet the proposed diagnostic requirements of IGD. In many countries, however, there are no specialist services to cater to the growing social need for prevention and intervention measures.

Health practitioners are often confronted by challenges related to conceptualizing and responding to the needs of individuals with IGD. This book will guide the reader through the relevant theory and practical work on IGD and problem gaming. It will be explained *why* people become addicted to games and *how* we can respond to them. It is hoped that this work will help researchers and practitioners in undertaking more novel and effective work, toward more comprehensive understanding and formal recognition of this emerging disorder.

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Theories and models of IGD

2

Chapter Outline

Introduction and overview

The dream of a perfect conceptual model of problem gaming is likely to be chimerical. Just as a video game attempts to simulate the interactions of avatars in virtual space, a psychological model attempts to create a visual representation of the client's presenting problem. In both cases, concise representations are often preferred because the human mind tends to reject an overabundance of detail, particularly when it is close to reality but not quite right (Mori, 1970). As Eco (1994) wrote, a cartographer's map that is so faithfully precise that it becomes immense in size will be impractical and flawed in the way that every detail is subject to error. Ultimately, it will be discarded.

The lesson is that reality is usually best conveyed and perceived when only the *most salient* details are captured. A practical model of IGD should, therefore, focus on the most important variables related to the initiation, development, and maintenance of the gaming problem. A concise but illuminating model can be valuable not only to those parties responsible for the management and treatment of IGD cases, but also those with IGD to help them make sense of their personal struggle with gaming.

The study of the development and classification of psychopathology has long been guided by two schools of thought: *nomothetic* and *idiographic* approaches. The

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nomothetic approach relies on objective procedures and statistical data drawn from large populations to reach conclusions about mental disorders. Information obtained in this way may lead, for example, to the creation of a general profile of characteristics of a problematic user, or multiple groups defined by certain cooccurring features. In this way, the nomothetic approach may be said to describe everyone but no single person in particular—it is the "psychology of the stranger" (McAdams, 2006). The early study of problem gaming was dominated by nomothetic research, usually surveys of young gamers. This led to generalizations about problem gaming that it was predominantly the domain of "socially withdrawn male adolescents with limited sex role identity" (Griffiths, Davies, & Chappell, 2003, p. 81).

The idiographic perspective, by comparison, focuses on personal stories from individuals, attending to each person's unique aspects using, for example, unstructured interviews. The approach describes the origins, course, and distinctive nature of an individual's mental disorder. However, there have been relatively few idiographic studies of problem gaming, such as clinical or developmental case reports prepared by trained practitioners (e.g., Allison et al., 2006). Recognizing the IGD field's tendency toward nomothetic approaches, this chapter will describe the concept of addiction and how it has been applied to problem gaming. A key point in this discussion will be the way in which nomothetic research on IGD has been guided by approaches taken from the field of pathological gambling.

As a DSM-5 "condition for further study", IGD is currently seeking legitimate status in clinical psychology and psychiatry. This endeavor is reflected by the many diverse models and theories on the nature of problem gaming, each one an attempt to find a secure foothold in clinical nomenclature. Much work on IGD has grown from the concepts carried from more developed addiction fields, such as gambling and substance use. However, some scholars have challenged the validity of the addiction model, in part or whole, as applied to gaming. At the same time, the concept of addiction itself has been debated for many decades. It is not the principal purpose of this chapter to consider these broader theoretical debates in detail. Instead, our focus will be on the application of addiction theory to models of problem gaming behavior, including whether some addiction concepts are meaningful in this context.

This chapter will begin with a brief overview of some definitions of addiction and will highlight the diversity of perspectives as well as the consensus on the central importance of impaired control. We will then summarize some of the first research conducted on problem gaming in the 1980s and 90s and explain how this work informed theory and the current classification of IGD. Several prototypical models of IGD, including cognitive-behavioral, neurocognitive, and multidimensional models, will then be presented in detail.

Defining addiction

The concept of "addiction" has been defined in many ways. Such definitions have extended from socially defined constructs in which no single definition can be said to be "correct," but where some might be considered to be more useful than others

(West & Farrell, 2015), including specific criteria-based definitions. Etymologically, the term addiction originates from the Latin word *addicere*, meaning to be legally given over to somebody as a bond-slave (Alexander & Schweighofer, 1988; Taipale, 2017). However, as time has gone by, the term has come to be used more broadly as referring to circumstances where people give themselves over to someone or something else.

In the 19th and 20th centuries, use of the term narrowed to become associated with recognized vices, including drug use, and was therefore seen as a form of disease. By the end of the 21st century, it had become acceptable to extend the term to behaviors such as gambling (e.g., Blaszczynski, Buhrich, & McConaghy, 1985; Dickerson, 1977), and then beyond this to encompass other appetitive behaviors (Griffiths, 1996; Marks, 1990; Potenza, 2006), including computer use (Shotton, 1989), Internet use (Young, 1998), and gaming (Fisher, 1995); a development which has sometimes not been endorsed or welcomed by scholars working in the addiction field (Blaszczynski, 2006; Shaffer, Hall, & Vander Bilt, 2000).

When one looks to theory for guidance as to which definition to follow, the challenge immediately becomes evident (Chamberlain et al., 2016). Where should one begin? West and Brown (2013) have estimated that there are at least 60 separate theories of addictive behavior. Some of these theories refer to addiction as a "brain disease," emphasizing the role of brain changes and neuroadaptation following repeated use of a substance. Other theories have referred to concepts such as maladaptive choices, excessive appetite, and overwhelming urges that lead to overuse. Recognizing these different approaches to addiction, Vaillant (1982) suggested that, instead of seeking a strict operational definition, addiction should perhaps be thought of as a mountain or a season: *something that we know when we see it*. Accordingly, a more pragmatic alternative may be to unify certain theories and findings across disciplines into a single model of addictive behaviors and concepts (Skinner & Aubin, 2010).

Impaired control is a concept that appears central to many theoretical models (Everitt & Robbins, 2005; Lyvers, 2000; Marlatt, 1978). For example, Walker (1989) defined addiction as "a persistent behavioural pattern characterised by a desire or need to continue the activity which places it outside voluntary control; a tendency to increase the frequency or amount of the activity over time; psychological dependence on the pleasurable effects of the activity; and, a detrimental effect on the individual and society" (p. 179). Goodman (1990) referred to addiction as a process whereby a behavior that can function both to produce pleasure and to provide escape from internal discomfort is employed in a pattern characterized by: (a) *recurrent failure to control* the behavior (powerlessness) and (b) continuation of the behavior despite significant negative consequences. Everitt and Robbins (2005) described addiction as "the endpoint of a series of transitions from initial drug use – when a drug is voluntarily taken because it has reinforcing, often hedonic, effects – through loss of control over this behavior, such that it becomes habitual and ultimately compulsive" (p. 1481).

In this book, we are guided by the clinical definitions of gaming disorder within the most recent DSM and ICD systems, and by the dominant conceptual models of gaming disorder, which will be described in detail in the following sections. Above all, these models have emphasized the importance of impaired control over gaming and the significant negative consequences of persistent and uncontrolled use of games (Billieux et al., 2017).

Addiction components: Does one size fit all?

Some of the basic concepts across many definitions of addiction have been presented together in the "components" model of addiction (Brown, 1997). This model conceptualizes addiction as being composed of six "core" features: (1) *salience*, meaning the substance or activity is viewed as the most important thing in the person's life and is thought about at all times of the day; (2) *tolerance*, the process whereby a stronger dose of a substance or an increasing amount of time engaged in the activity is required to achieve former mood-modifying effects; (3) *withdrawal*, the unpleasant mood states or physical effects that occur when the substance or activity is suddenly discontinued or reduced; (4) *relapse*, the tendency for repeated reversions to earlier patterns of use, and for even extreme patterns of use to be restored quickly after periods of abstinence or regulation; (5) *mood modification*, the subjective experience (e.g., an exciting "buzz" or tranquilizing "numbing") associated with engaging in the activity; and (6) *harm*, the conflict between the user and those around them, including work, school, social life, or hobbies, which results from use of the substance or activity.

The components model has been used extensively by Griffiths (2005) and many other researchers to study different behaviors, following an assumption that any behavior that meets all six criteria may be "addictive"—sometimes without much exploration of alternative explanations as to why these individuals might be endorsing components items. As Van der Linden (2015) has argued, this confirmatory research practice has led to some questionable designations, such as "addictions" to tanning, fortune telling, studying, and tango dancing. Similarly, at the time of writing (December 2017), an addiction to taking "selfies" was published in *International Journal of Mental Health and Addiction* and widely publicized by its authors as a new "condition."

The integrity of the field of behavioral addictions may be threatened by an overabundance of new addictive conditions being proposed based on confirmatory approaches using the components model (Billieux, Schimmenti, Khazaal, Maurage, & Heeren, 2015). As noted above, many of the concepts in the components model may align with actual symptoms observed in clinical cases. However, the narrow application of the model to "confirm" the existence of new disorders without obtaining supporting evidence and/or ruling out alternative explanations (e.g., narcissistic tendencies may explain excessive acts of taking "selfies") warrants strong scrutiny.

Some studies have queried the appropriateness of applying the components model *unreservedly* to gaming. For example, Charlton (2002) surveyed 404 undergraduates using a checklist of problem gaming based on the components model. Factor analysis of the checklist indicated a two-factor structure, which included "engagement" and "addiction" factors. Some components, including salience, tolerance, and mood modification, loaded onto both factors, and therefore, were weak discriminators of problematic use. Charlton argued that these "engagement" items could potentially misclassify normal behaviors as problematic in some cases and could, therefore, inflate prevalence estimates of so-called risky users (i.e., individuals who meet only a few "engagement" criteria). Components such as "conflict" and "withdrawal" were more strongly related to addiction than other criteria.

Another study by Snodgrass et al. (2017) surveyed 672 gamers about their gaming experiences in relation to the components model. The authors reported that 76% of the sample were opposed to the concept of gaming "tolerance" as described in the components model, which was further supported by interviews where participants "vocally rejected this concept's appropriateness for framing their negative experiences" (p. 298). Some researchers have also expressed uncertainty about the components model, with recent disagreements on the most suitable wording and definition for each component (Griffiths et al., 2016; Petry et al., 2014; Weinstein & Lejoyeux, 2010). Some literature suggests that the components model may provide a useful starting point for developing assumptions and hypotheses, but researchers should be cautious in applying a generic "one size fits all" approach to all behaviors (Kardefelt-Winther et al., 2017). All repetitive behaviors should not be considered the same in principle.

Gaming as an addiction: Studies in the arcade arts

Newcomers to the field may wonder how gaming first came to be viewed seriously as an addictive behavior. Prior to any reference to problem gaming in clinical psychology or psychiatry, the term "addictive" had already been used colloquially in relation to gaming across many cultures. A game's "addictiveness" referred to its positive qualities encompassing its mechanics and playability, and the player's immediate enjoyment and/or intense desire to continue playing the game. The term was—and still is—commonly used among gamers and gaming journalists seemingly as a term of endearment, as well as a metric, like graphics or sound, to evaluate the subjective quality of a game. In the 1980s, several teams of researchers from different countries began to undertake research on adolescent gaming. This research was motivated partly by increasing concerns that screen time was interfering with normal development and school performance. The term "addictive" began to appear in academic journals to refer to these individuals' apparent overuse of games. Some of the first research studies, described in more detail below, attempted to describe "addictive" playstyles within the social context and developmental functions of gaming in the lives of adolescents.

A turning point for the field came shortly after when researchers with experience in gambling research, including Sue Fisher and Mark Griffiths in the United Kingdom (UK), became interested in gaming behaviors and emphasized the similarities between gaming and electronic gambling machines, including "fruit machines," a low-stakes slot machine legally available for all ages in the United Kingdom. Gaming and gambling shared the requirement of money to play and an inherent randomness in their rewards and payout (Griffiths, 1991). Thus, gambling methodologies were applied to gaming, including the adaptation of screening tools developed for the DSM-III and DSM-IV-TR categories of pathological gambling (Fisher, 1994).

An academic view of problem gaming as essentially similar to problem gambling emerged from studies of young people who gamed in arcade parlors. Adolescents were seen to be spending considerable time in these settings, with some missing school and stealing money from their parents to finance their gaming. Researchers proposed that problematic arcade machine gaming, like gambling, may involve diminished or

impaired control over gaming behavior. Problem gaming was considered to be a less severe form of pathological gambling by virtue of being a "nonfinancial form of gambling" (Griffiths, 1991: p. 54).

Some researchers even theorized that arcade players, due to shared vulnerabilities with gamblers, might be more susceptible than nonplayers to transitioning to gambling when they reached the legal age requirement (Brown, 1989; Brown & Robertson, 1993; Delfabbro, King, Lambos, & Puglies, 2009; Gupta & Derevensky, 1996; Griffiths & Wood, 2000). This argument is still being debated in relation to some online games, particularly those games that resemble gambling in the way they look and play (Forrest, King, & Delfabbro, 2016; Gainsbury, Hing, Delfabbro, Dewar, & King, 2015; Gainsbury, Russell, King, Delfabbro, & Hing, 2016; Kim, Wohl, Salmon, Gupta, & Derevensky, 2015).

Early studies showed that some adolescent arcade gamers played regularly and spent most of their available money on games (Graham, 1988; Selnow, 1984). Researchers suspected that some individuals were prioritizing gaming over other important aspects of life, and therefore, may be becoming "addicted" to gaming. For example, Egli and Meyers (1984) reported that 13% of their sample of 151 adolescents were "heavy" users who sacrificed the buying of food, clothes, cinema visits, and sporting activities in order to play arcade machines. The authors referred to some participants as "compulsive" and "somewhat addicted" users. Similar results were reported by McClure and Mears (1984), with 26% of their sample of 336 secondary school students using part or all of their lunch money to finance gaming.

In reviewing these early studies, researchers were somewhat ambivalent or not fully convinced that their participants were truly addicted to gaming. McClure and Myers described frequent gamers as bright, competitive, and challenge-seeking individuals, who enjoyed science fiction and reading books. Egli and Meyers (1984) noted that participants reportedly felt that gaming was a better alternative to riskier activities (e.g., experimentation with drugs, fighting with other boys), and that even frequent players tended to play in balance with other life activities. In the absence of relevant clinical information in profiling these adolescent heavy arcade players, these researchers seemed to feel that many participants were simply typical Caucasian, middle-class teenagers who happened to be really enthusiastic about gaming.

Gambling tools to study gaming

The adoption of addiction-based screening tools in subsequent studies was arguably the principal factor that positioned gaming behavior within addiction models and theories. The approaches used and refined to study gambling were much better equipped to identify the potential negative consequences of excessive gaming. Fisher's (1994) study of 467 secondary school students serves as a notable example. This study adapted the DSM-IV-J measure of pathological gambling to screen for arcade gaming-related problems in adolescents. It was reported that 6% of participants could be classified as "pathological" users using these criteria.

Fisher's study was criticized by Abbott, Palmisano, and Dickerson (1995), who argued that the study was confounded in some areas and did not capture adequately the concept of impaired control. However, the screening approach used by Fisher and other researchers at this time was still adopted for many years, until tools more specific to problem gaming were developed in the late 2000s as online gaming became popular (Ferguson, Coulson, & Barnett, 2011).

Gambling-based screening tools adapted to gaming (i.e., using modified wording: usually substituting *gaming* for *gambling* and *time* for *money*) continued to be used even as home console gaming became increasingly popular (and arcade gaming declined) through the 1990s and 2000s. However, console games differ structurally from arcade games and are, therefore, even more dissimilar to electronic gambling. These differences had several implications for screening that were overlooked at the time, for example:

(1) console games do not require money to play each time the player loads up a game, so the player does not necessarily need to increase the amount of money spent on gaming as he or she becomes more involved or plays longer;
(2) console games usually include the ability to save game progress, which generally reduces the need for the player to "chase" losses because certain types of losses are temporary when progress can be restored; and
(3) console games are situated in the home, usually the bedroom, thus reducing the player's ability to deceive or lie about use due to parental surveillance over gaming activities. Therefore, some items within gambling scales (e.g., tolerance, chasing, and deception) may not have applied or translated poorly to console gaming.

Despite these measurement issues, research on problematic gaming in the 1990s continued to develop through the lens of problem gambling (Griffiths & Hunt, 1998). Scholars' tendency to fit gaming into the gambling mold, rather than develop a new conceptualization, influenced the prevailing view of gaming as a potential addictive disorder, including its eventual proposal for inclusion in the DSM-5 within its new section *Substance-Related and Addictive Disorders*. One may speculate that it was inevitable for gaming to be recognized as "addictive," irrespective of these links to gambling. However, the attention from gambling researchers was important because it encouraged the recognition and exploration of gaming issues by the wider addictions community. These early studies guided by gambling models were clearly the foundation for further research in support of gaming as an addiction in the years that followed.

Problem gaming: A brief history of "time"

When defining problem gaming, it is important to acknowledge the variable of *time spent gaming*, which is almost always assessed in IGD research. Many of us have an intuitive concept of how much time may be "too much" to spend involved in any single activity, irrespective of its effects or outcomes. This amount of time will vary depending on the person and the activity, but many agree that gaming "almost all the time" is counterproductive to good health. Accordingly, researchers have reasoned that certain

durations of gaming time may be used as an adjunctive measure of problematic use. This view has been advanced since the first studies in the 1980s and 90s, where, for example, "excessive" gaming was defined as playing on more than seven occasions in a week and for longer than 4 h (Abbott et al., 1995).

Similarly, clinical intervention studies have used "problematic" hourly cut-offs as one of the inclusion criteria for treatment, such as "daily play exceeding 4 hours" (Han, Hwang, & Renshaw, 2010; Li & Wang, 2013). Our reviews have found that it is often assumed that gaming for 30 h or more per week tends to have negative consequences for most users, including: (1) interference with daily responsibilities and routines, and (2) loss of opportunities for healthy development, particularly for younger users. However, the relationship between time spent gaming and negative consequences has received mixed empirical support (Hellström, Nilsson, Leppert, & Åslund, 2012; King & Delfabbro, 2016a; Kuss, Louws, & Wiers, 2012; Tokunaga & Rains, 2010).

Time spent gaming may be comparable to financial expenditure in gambling—these variables can help to understand an individual's *situation* but may not necessarily provide much insight into *harm*. What one player can comfortably "afford" may be ruinous to another. Gaming time is not equivalent to the dose of a substance, for example, where higher volumes of a substance (e.g., eight standard alcoholic drinks) consumed on a regular basis (e.g., daily) are known to have associated risks or a specific detrimental effect on users. Some individuals can safely play games for 25 h per week (i.e., report no IGD symptoms), whereas others may be negatively affected by this level of use.

At the *extreme* end of the spectrum (e.g., playing >70 h per week), gaming time becomes much better at discriminating problematic users. In our experience, gaming for 20–30 h per week can be common in both normal and problematic young adult populations (King, Delfabbro, & Griffiths, 2013; King, Delfabbro, Zwaans, & Kaptsis, 2013). Further complicating this issue, it is known that, for some individuals (e.g., male adolescents), there may be certain benefits (e.g., social advantages) related to moderate use of games, meaning that total nonuse (i.e., gaming abstinence) may have some detrimental effects on well-being that are comparable to overuse (Willoughby, 2008). Time spent gaming must, therefore, be anchored to other variables—the user, gaming content, the situation, and the social context—to be meaningful.

DSM-5 classification of IGD

More than three decades after the first studies of "gaming addiction" (e.g., McClure & Mears, 1984), IGD was published on page 795 of the DSM-5 in the section called "Conditions for further study". As noted throughout this book, IGD is not yet an accepted diagnosis and is claimed to require more evidence (we note, however, that the required types and volume of evidence to achieve legitimacy are not specified—as such, it is difficult to estimate how close IGD is to becoming a recognized disorder). "Gaming disorder" (GD) is anticipated in the upcoming ICD-11, to be published in May 2018, and will be the first official gaming-related disorder. Nevertheless, the DSM-5 IGD criteria provide a useful conceptualization of problematic gaming behavior, and its features align with the description of GD in the ICD-11.

The proposed IGD definition refers to "persistent and recurrent use of the Internet to engage in games, often with other players, leading to clinically significant impairment or distress" (APA, 2013; p. 795). By its name, IGD refers to online gaming, consistent with clinical observations that the vast majority of cases involve online gaming (e.g., 98% of gaming-related referrals to the Kurihama Medical and Addiction Center in 2016 concerned online gaming-related problems), but IGD also encompasses offline gaming behavior too. IGD is indicated by meeting five or more of the following criteria in a 12-month period:

1. *Preoccupation*. Thinking about previous gaming activity or anticipation of playing the next game; Internet gaming becomes the dominant activity in daily life.
2. *Withdrawal.* Symptoms typically including irritability, anxiety, or sadness when Internet gaming is taken away, but there are no physical signs of pharmacological withdrawal.
3. *Tolerance*. The need to spend increasing amounts of time engaged in Internet games.
4. *Loss of control.* Unsuccessful attempts to control the participation in Internet games.
5. *Loss of nongaming interests.* Loss of interest in previous hobbies and entertainment as a result of, and with the exception of, Internet games.
6. *Gaming despite harms.* Continued excessive use of Internet games despite knowledge of psychosocial problems.
7. *Deception of others about gaming.* Deception of family members, therapists, or others regarding the amount of Internet gaming.
8. *Gaming for escape or mood relief.* Use of Internet games to escape or relieve a negative mood (e.g., feelings of helplessness, guilt, anxiety).
9. *Conflict/interference due to gaming.* Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of participation in Internet games.

Challenges in adapting addiction concepts: The case of "tolerance"

It is clear from the discussion so far that the study of behavioral addictions has sometimes involved an assumption that any behavior can be addictive under certain conditions. This was evident in early studies that likened problematic gaming to pathological gambling, and in studies that applied the components model to online gaming and other Internet-related activities. The logic underlying gaming-gambling comparisons may be expressed as the following syllogism: *Gaming and gambling appear to be the same. If gambling is addictive, then gaming can be too.*

Researchers in the addictions field have criticized this reasoning, on the grounds of: (1) *logical fallacy* (i.e., false equivalence), (2) *insufficient clinical evidence* (e.g., lack of psychiatric cases), and (3) *ethical implications* (e.g., trivializing the concept of addiction) (Shaffer et al., 2000). Along the same lines, some scholars have highlighted the problem of "opening the floodgates" to all types of behaviors as new addictions (see Billieux et al., 2015), particularly online activities (Blaszczynski, 2006; Starcevic & Billieux, 2017). Notwithstanding these issues, the practical application of substance-based addiction concepts to activity-based behaviors has had its own challenges. Tolerance, for example, has been difficult to operationalize for gaming because

this concept tends to be used to describe neurobiological changes related to increasing substance use (Shaffer, 1997; Starcevic, 2016).

Tolerance is an important concept in addiction theory that helps to explain the addictive cycle of drug-using and other repetitive behaviors (Mendelson, Sholar, Mello, Teoh, & Sholar, 1998). For example, the drive to reduce aversive withdrawal states forms the basis for dependence in negative reinforcement models of addiction (Baker, Piper, McCarthy, Majeskie, & Fiore, 2004). The proposed IGD classification contains an explicit definition of tolerance that refers to a need to engage in an "increasing amount of time" spent gaming. This definition seems intuitive, on the one hand; however, gaming can often require a lot of time of players in its more advanced forms, and certain games (e.g., Massively Multiplayer Online [MMO] games) are designed to require increasingly more time and effort from players seeking to make consistent progress (King & Delfabbro, 2016b). This increasing time requirement can, therefore, create an impression of "tolerance" among enthusiastic but otherwise nonproblematic players.

A related issue is that there would appear to be a *physical limit* beyond which it is difficult for a player to increase their gaming time, and therefore, chronic problem gamers (i.e., those playing at very high levels for many years) may report that they no longer feel a need to "increase" their gaming time. Dilemmas like those discussed in the previous section on "time spent gaming", thus, appear to arise. Employing a concept of tolerance that is defined by "time" and applying this to a complex activity like gaming is fraught because gaming time itself may not be related to harm. There are still many unknowns about the range of stimuli and factors that maintain gaming activity and their effects on gamers (King & Delfabbro, 2016b). Neuroimaging studies of craving for gaming, for example, are only just beginning to understand the brain-related changes associated with prolonged gaming (Dong, Wang, Du, & Potenza, 2017; Kim et al., 2011; Han et al., 2007, Han et al., 2011).

Several attempts to define tolerance specifically in relation to gaming have been made. Tao et al. (2010) and Weinstein and Lejoyeux (2010) defined gaming tolerance as the need for more advanced computer equipment, more software, and/or more hours of use. As another example, Petry et al. (2014) referred to tolerance as "playing more exciting games", which could be interpreted by players in multiple ways (e.g., new game levels, content, modes, or titles), among other components such as a need for increasing time.

To explore a variety of potential gaming reward stimuli that may be related to tolerance, in 2016 we conducted an online survey of 630 adult gamers that included a 20-item measure of gaming-related tolerance (King, Herd, & Delfabbro, 2017, 2018). The survey referred to a variety of gaming experiences, including *seeking rarer rewards* (Kuss et al., 2012), *accumulating more wealth* (Kelly, 2004), *seeking more novel rewards* (Wood, Griffiths, Chappell, & Davies, 2004), and *the fear of missing out* (Przybylski, Murayama, DeHaan, & Gladwell, 2013). Each item referred to an "increasing need" for each experience.

Exploratory factor analysis indicated that a three-factor model provided the best fit. These factors were: (1) *Wealth*, the need to accumulate in-game rewards of increasing rarity, novelty, or quantity; (2) *Achievement*, the need to pursue goal-driven activities

of increasing complexity, difficulty, or uniqueness; and (3) *Inadequacy*, the need to rectify perceived insufficiencies in gaming capability or progress. Further statistical analysis indicated that the *Inadequacy* factor was modestly but significantly related to other IGD symptoms, after controlling for age, gender, and time spent gaming.

Overall, the findings suggested that problematic gaming may be motivated by the player's need for completion of increasingly more intricate, time-consuming, or difficult goals to achieve a desired state of immersion in the game and to reduce fears of personal inadequacy or "missing out" (King et al., 2018). But is this really *tolerance* or is it something else? And do these factors apply to *all* types of players of *all* types of online games?

Such questions may invite further doubt about the concept of gaming tolerance, adding to concerns about the reliance on "time" and the lack of detail on what problem gamers actually seek from games when they play. An alcoholic does not primarily seek increasing *time* spent in a bar, nor does a gambler seek increasing *time* spent in a casino. Increasing time in these examples is a by-product of a need to consume alcohol or place bets. Pinpointing a "dose" in gaming is not straightforward.

The preliminary research described above suggested that some problematic players may develop *increasingly specific* or *specialized* goals, which may result in "withdrawal" (i.e., boredom, irritability; see Kaptsis, King, Delfabbro, & Gradisar, 2016) when their goals are not satisfied. Research on game-related craving, withdrawal, and tolerance symptoms is still tentative and warrants replication (Dong et al., 2017; King, Kaptsis, Delfabbro, & Gradisar, 2016; Ko et al., 2013). We have expressed caution in our work that has explored modifications to concepts like tolerance to gaming because it is debateable whether the initial concept is preserved and still meaningful.

A simpler alternative may be to discard the concept of tolerance altogether for some behaviors (Starcevic, 2016). The ICD-11 classification of gaming disorder (see Chapter 5)—unlike IGD in the DSM-5—has taken this streamlined approach by not including references to the concept of tolerance or withdrawal. Practicality and parsimony are important for a classification system—overcomplicated descriptions and guidelines may not help clinicians in their work nor help clients to understand their diagnosis.

Applying the criteria from substance use disorders to behavioral (or "process") addictions may be problematic if the resulting concepts contain unclear, convoluted, or jargon-filled language. This is not to say that the IGD criteria are inherently flawed, but rather to argue there may be some important differences across addictive behaviors that should be reflected in their clinical descriptions. Researchers are trying to determine how some of these pieces may fit in the gaming disorder puzzle. As noted by Rehbein, Kliem, Baier, Mößle, and Petry (2015), many of the IGD concepts are useful despite these issues because they provide the necessary means to "start somewhere."

Prototypical IGD models

Having discussed some of the relevant background and current definitions of problem gaming, the following sections will discuss three prominent models of problematic gaming and/or IGD. These models have been chosen because they provide clear

prototypical examples of different orientations to conceptualizing IGD, including: (1) *cognitive-behavioral*, (2) *neurocognitive*, and (3) *multidimensional* (i.e., a combination of interacting biopsychosocial factors) approaches. The aim was to present models by leading researchers that are highly regarded and cited in the IGD field and to use these models to illustrate some of the developments and refinements in thinking about gaming disorder over the last two decades.

These models differ in some ways (i.e., core psychopathology), but they have several commonalities (e.g., importance of conditioning effects of gaming rewards). These models will show that the clinical conceptualization of problem gaming has included views of gaming as a *distinct disorder* and as a *potential subtype* of a general problem with Internet use.

An early cognitive-behavioral model

Davis (2001) proposed one of the first cognitive-behavioral models to explain the development of "pathological" Internet use. Fig. 2.1 provides a summary of the model. Two types of pathological use were described: (1) *specific*, referring to pathological use on the Internet for a specific purpose (e.g., browsing, shopping, or gambling); and *generalized*, referring to a global set of behaviors that occur online. While the model does not make a direct reference to online gaming, this activity would be included in the "specific" category.

Davis's model, published about 12 years before IGD, was proposed in the DSM-5 and has only 11 references, which is scant for an academic paper, but shows, perhaps, how relatively little work on problem gaming was useful for theory-building. Notably, Davis has cited Beck's (1976) cognitive theory of depression, and three additional papers on depression, and these works clearly provided the foundation for the model's description of maladaptive cognitions—the primary focus of the model.

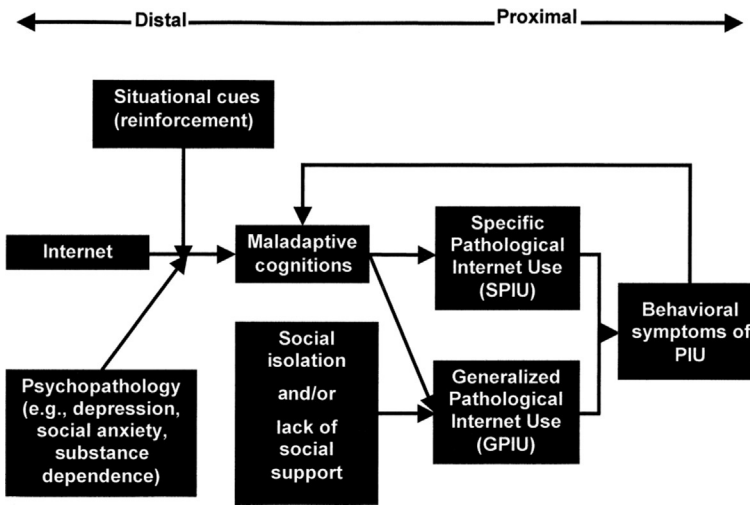

Fig. 2.1 Davis' (2001) cognitive-behavioral conceptualization of problematic Internet use.

Davis proposed that cognitive variables were the *sufficient cause* of symptoms of problematic Internet use, meaning that their presence guaranteed the occurrence of symptoms. As a basic summary of the model, Davis argued that pathological Internet use resulted from "problematic cognitions coupled with behaviors that either intensify or maintain the maladaptive response" (p. 191). She further argued that the social communication aspects of the Internet reinforce problematic beliefs about the self, others, and the world, which maintain the desire to live an exclusively "virtual social life" (p. 188).

Davis proposed that maladaptive cognitions fell into two main categories: (1) *thoughts about the self* and (2) *thoughts about the world*. The first category referred to cognitive concepts including self-doubt, low self-efficacy, and negative self-appraisal. Vulnerable individuals have a negative self-concept and, with an increasing investment in online activities, come to view the Internet as the most reliable means of gaining positive social feedback and acceptance. Such self-related cognitions could arguably be considered comparable to the depressive thinking styles described by Beck (1976), particular when he writes about thoughts about the self as essentially "worthless" or "unlovable," but with the additional element that online activities provide a means of compensating for these deficiencies.

Davis referred to a dichotomy of the self: the unwanted "real world self" vs the desirable "online self." Examples of this include: "*I am only good on the Internet*" and "*I am worthless offline, but online I am someone*". The second category of maladaptive cognitions referred to the act of generalizing from specific events to global trends. Once again, similar cognitions can be observed in Beck's cognitive theory of depression. Examples included "*The Internet is the only place I can feel safe*" and "*Nobody loves me offline*".

Davis explained that Internet-related maladaptive cognitions developed from thinking styles rooted in preexisting psychopathology (e.g., depression). An individual's Internet use elicited desired physiological responses (e.g., pleasure from social feedback) that reinforced the belief that the Internet was preferable to all other activities, including life in the real world. Davis proposed that this stimulus–response relationship established a "vicious cycle"—that is, rumination and negative thoughts can lead an individual to recall more reinforced memories about the Internet and this, in turn, can encourage engagement in online activities to achieve the same response as the one associated with the initial event.

The benefits of Davis's model include its parsimony and clear therapeutic applications. Techniques such as exposure and response prevention (ERP) and behavioral experiments, for example, are clearly indicated by the model. Subsequent research led to the identification of more cognitive variables, including faulty decision-making processes and cognitions specific to certain online activities, which will be detailed in the next two models.

A neurocognitive model

The study of IGD has often benefitted from developments in other addiction fields. This has included knowledge gained from neurocognitive studies on substance and nonsubstance addictions (Schiebener & Brand, 2017). This body of work has also

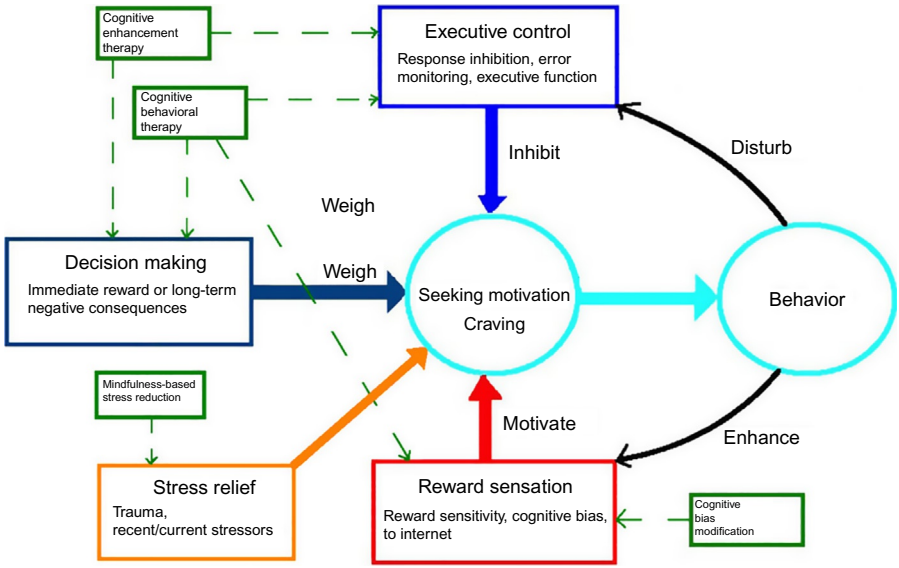

Fig. 2.2 Dong and Potenza's (2014) model of Internet gaming disorder.

guided the development of similar neuroimaging studies on gaming behavior (e.g., Dong & Potenza, 2016; Wang et al., 2017). Drawing on knowledge in this area, Dong and Potenza (2014) proposed a neurocognitive model of IGD. Fig. 2.2 provides a summary of the model. The model posited that, like drug addictions, an individual's online gaming experiences alter brain structure and function, and related cognitive processes, in ways that serve to perpetuate gaming.

Dong and Potenza focused on three components and their role in addictive gaming behavior: (1) motivational drives related to reward-seeking and stress-reduction, (2) behavioral control related to executive function, and (3) decision-making that involves weighing the pros and cons of engaging in motivated behaviors. As a basic summary, the model proposed that motivational drives linked to reward-seeking contributed to problematic gaming behavior, and that diminished executive function and cognitive control over these drives contributed to nonoptimal decisions about future gaming.

Dong and Potenza's model proposes that IGD symptoms are developed and strengthened by a variety of interrelated processes. First, individuals with IGD have enhanced reward sensitivity and decreased loss sensitivity, meaning that these individuals will be more prone to gaming for longer periods of time because they tend to have stronger motivations to play. Winning elicits stronger physiological reactions for these players, whereas losing experiences are relatively less impactful. The model highlights the important role of executive systems that govern players' motivations to seek rewards. Individuals with IGD have reduced response-inhibition and cognitive-control tendencies. This means that, for these individuals, online gaming stimuli tend to garner more attentional resources (i.e., greater focus on gaming tasks), elicit automatic behaviors (i.e., initiating and completing gaming events), and playing styles that are inflexible to other needs (i.e., continuing to play despite competing demands on time).

These processes affect the individual's ability to make sound decisions about gaming, specifically in relation to weighing the short-term pleasure of playing against the negative long-term consequences of gaming. Dong and Potenza explained that individuals with IGD tend to have a "myopia for the future", meaning that they are much less capable of considering the future experiential outcomes of decisions related to their gaming behavior. Problematic players essentially play games "in the moment", constantly chasing the next thrill in the game.

Neurocognitive models are useful because they emphasize *reward-seeking* and its effects on the brain, which aligns well with the conceptualization of gaming disorder as a form of addiction. In addition, whereas Davis' (2001) model appeared to view problematic use as more comparable to a mood disorder, Dong and Potenza's model was much more consistent with concepts such as loss of control and craving. Such perspectives may fit more readily with an IGD client's experiences and understanding of problematic gaming, including losing track of time when playing or deciding to continue playing rather than fulfill an important responsibility (e.g., going to work). The neurocognitive conceptualization was, therefore, more distinctly "pathological" than previous cognitive models (Davis, 2001) that described a stable preference for a virtual social life. Indeed, the belief that the online world offers more enjoyment or social opportunities than the real world may be true for many people, including healthy users.

For therapists, applying the neurocognitive approach may help to avoid having to navigate potential value judgments concerning real versus virtual activities, e.g., a client defending the belief that his or her online identity and social interactions are beneficial and not inherently "problematic." Instead, therapeutic work can focus on helping the client to *regain control* over their gaming and related online activities. In this way, Dong and Potenza's model has clear implications in terms of addressing individuals' motivational drives and stress; the modification of consequences of gaming behavior (e.g., contingency management); and the use of cognitive strategies to countervail urges and manage risky situations that lead to gaming.

A multidimensional or biopsychosocial model

The final model for discussion is the Interaction of Person-Affect-Cognition-Execution (I-PACE) model, which was recently developed by Brand et al. (2016). This model synthesizes a wide range of theoretical considerations and empirical findings in the field of Internet use disorders. The I-PACE model provides a comprehensive theoretical framework that aims to explain, not only problematic gaming, but also other behaviors that occur in online environments, including gambling, pornography viewing, shopping, and social networking.

The model consolidated Dong and Potenza's (2014) work as well as an earlier model by Brand, Young, and Laier (2014) that was published at around the same time, in addition to newer findings on Internet use disorders. The resultant model is an impressive integration of factors known to influence addictive online behavior. One of its innovations is that it provides a detailed and concise overview of the ways that each factor is specifically related to others in the model, including differences across

some online activities. It was beyond the scope of this chapter to provide a complete summary of the I-PACE model in all its complexity (see Brand et al., 2016); however, a brief summary will be provided here.

The I-PACE model includes the following main components: (1) *predisposing variables*, referring to an individual's core characteristics which are relatively stable over time (e.g., genetic factors, personality factors, childhood experiences); (2) *affective and cognitive responses to internal or external stimuli*, referring to changes in mood and thought that follow exposure to gaming stimuli, including coping tendencies, cognitive biases, attentional biases, craving and urges; (3) *executive and inhibitory control, and decision-making behavior resulting in use*, referring to deficits in executive function and response control that govern the decision to play games (as described in the previous model); and (4) *consequences of gaming or other Internet application*, referring to the experience of gratification and compensation resulting from use, and the transition from voluntary and impulsive behaviors to more habitual and compulsive use over time.

The I-PACE model considers IGD and other Internet use disorders to be the result of the interactions of these components. In basic terms, an individual who is predisposed to addiction seeks gratification from gaming activities, which leads to significant changes in emotional and cognitive responses to gaming, which results in habitual use to compensate for these changes (e.g., craving, urges), producing negative consequences (Fig. 2.3).

Model comparisons

These three models show that there has been a general progression in thinking on the core components of problematic gaming over time. Some of the early cognitive-behavioral work on Internet-related behaviors was based on depression theory and the maintaining role of social aspects of the Internet, given that users were often lonely, unhappy, and lethargic, and the Internet provided an escape from these feelings. Later models embraced more of the concepts in addiction, particularly craving and impaired control. These models recognized the specific motivational drives in gaming such as the need to attain game rewards and status, as opposed to just spending time online, drawing on research that had examined diverse playing styles in massively multiplayer online games (Yee, 2006).

A review of these models reveals that problematic gaming as a condition had been alternately conceptualized as its own *distinct* disorder, like gambling disorder, as well as a *subtype* of Internet use disorder. These different designations parallel some of the debate and decision-making on the clinical classification of gaming disorder in the DSM and ICD systems. The DSM-5 workgroup, for example, had initially considered "Internet use disorder" as a condition for further study, before deciding to revise this category to "Internet gaming disorder" about a year later. Similarly, the ICD-11 workgroup had proposed "Gaming disorder" after considering several other proposals. Some researchers, including Brand et al. (2016), have remained supportive of "Internet use disorder" for inclusion in ICD-11 to recognize gaming in addition to other online behaviors.

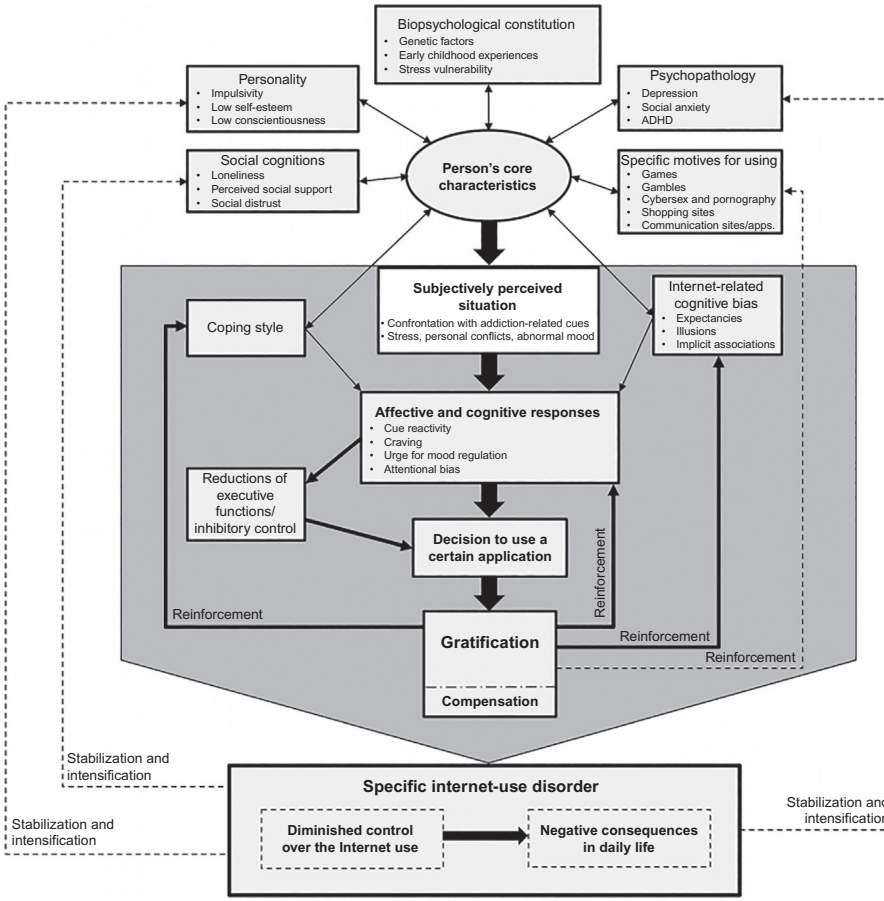

Fig. 2.3 The I-PACE model of Internet use disorders (Brand et al., 2016).

Table 2.1 presents a side-by-side summary of the three models, including their scope, core components, and proposed mechanisms in action (i.e., the "vicious cycle" of use). This may be a useful resource for practitioners in therapy (e.g., psychoeducation). While each model has unique elements, they share an emphasis on the important role of operant conditioning, referring to the immediate, intermittent, and secondary types of reinforcement that the individual receives from gaming experiences.

Researchers agree that gaming is a highly reinforcing activity (Király, Griffiths, & Demetrovics, 2015). This reinforcement can explain many types of repetitive gaming behaviors as well as the behavioral modifications that occur in life outside of gaming. Therefore, therapists should consider drawing on learning theory as a starting point in examining the impact of gaming. A leading question may be: *What makes gaming so rewarding for you*? This approach may be more accessible to some clients, particularly adolescents, than attempting to discuss cognitive or neuropsychological concepts (which may be better suited to later sessions). Collaboratively

Table 2.1 **A comparison of three prototypical models of IGD**

	Davis (2001)	Dong and Potenza (2014)	Brand et al. (2016)
Theoretical basis	Cognitive-behavioral	Cognitive-behavioral, neurocognitive	Multidimensional
Target activity	Pathological Internet use: *Specific* and *Generalized*	Internet gaming disorder (IGD)	Internet use disorders (IUDs) including subtypes
Vulnerability	Existing psychopathology (e.g., depression, social anxiety)	Neural processes underlying attention, response-inhibition, and behavioral flexibility	Neurobiological and psychopathological features, and motives
Core processes	Maladaptive cognitions	Motivational drives Behavioral control Decision-making	Interaction of predisposing factors, affective and cognitive responses, in combination with reduced executive functioning
"Vicious cycle"	Individual believes that the Internet is only safe place which leads to social withdrawal resulting in less self-worth and strengthening of maladaptive beliefs	Individual has high reward sensations which enhance an unregulated desire to play, resulting in reinforcement of continued use and poor short-term decisions, which maintains desires to play	Individual who is predisposed to addiction seeks gratification from specific activity, which leads to changes in affective and cognitive responses, resulting in greater use to compensate for these changes

identifying the rewarding aspects of gaming may lead to discussion of the client's personal characteristics and history in relation to how certain gaming experiences became problematic.

As a final note on neurocognitive models, it is pertinent to acknowledge that this work is based on relatively new and limited information. Few research teams are currently investigating IGD and related disorders from a neuropsychological perspective, with most of this work being undertaken in East Asia on specific types of gamers (e.g., male competitive gamers). Thus, relatively little is known about the developmental time course of the relevant neural pathways involved in IGD, and even less about how their development is affected by the use of different types of games (Bavelier et al., 2011).

Interestingly, some studies have shown that "professional gamers"—individuals who play games extensively (i.e., about 35–50 h per week) but do *not* meet any IGD criteria—differ neurologically from pathological gamers. A study by Han, Lyoo, and Renshaw (2012) found that professional gamers showed increased gray matter volumes of the left cingulate gyrus, whereas addicted gamers showed increased gray matter volumes of the left thalamus. This indicated that professional gamers were less likely to be impulsive and were more able to learn and self-correct from mistakes, whereas pathological gamers demonstrated a more unbalanced reward system due to dopamine conditioned reinforcement and reward expectation.

In another neuroimaging study of professional gamers by Hyun et al. (2013), professional gaming career length was found to be positively correlated with cortical thickness in several brain regions: the right superior frontal gyrus, right superior parietal gyrus, and right precentral gyrus. These brain regions contribute to cognitive flexibility, which is necessary to adapt and win in a competitive gaming environment. Therefore, a history of gaming for long periods (e.g., 10 h per day) in ways that are adaptive (i.e., gaming for social benefits and to earn a salary) has detectable biomarkers. Therefore, there may be many theoretical benefits in examining nongaming and professional gaming samples in addition to pathological players.

Are we overcompensating?

All three presented models referred to the *compensating* effects of gaming or Internet use. Specifically, each model proposed that gaming and/or online activities provide certain psychological gratifications, and/or a mood-relieving escape from reality. These mood-changing experiences are the precursor to habitual use leading to negative consequences. This is noteworthy because the term "compensation" (or a similar term, such as "coping") has frequently appeared in criticisms of gaming disorder and in counterproposals to the concept of pathological gaming. In essence, some scholars have argued that persistent gaming behaviors, rather than being addictive or pathological, can be sufficiently explained as repeated attempts *to compensate for* other underlying or primary problems (Wood, 2008).

As a recent example, Kardefelt-Winther (2014) advanced a "compensation model" that explicitly rejects the concept of "pathological use" and instead proposes that

"*negative life situations can give rise to a motivation to go online to alleviate negative feelings*" (p. 352). Kardefelt-Winther explained that this motivation may be either "healthy" or "unhealthy," but not "pathological." While it is generally productive for the field to be critical of new disorders and the concept of addiction in general, the "compensation" model or counterargument has flaws that warrant discussion. To begin, it is clear from the models presented in this chapter that compensatory use is actually a typical component (but not the only defining feature) of addictive behavior, rather than an alternative to it.

Compensatory use does not eliminate the possibility of addiction, nor does it account for users' problems more thoroughly than the addiction model. The concept of addiction is not undermined by the fact that addicts use substances or activities, including gaming, to cope with their problems or to compensate for deficits in other life areas. Similarly, while some individuals may suffer from mental disorders *and play games at problematic levels*, comorbid psychopathology will not always sufficiently account for all types of gaming-related problems.

Why do some researchers challenge the concept of gaming disorder on the basis that problem users appear to play games to cope with or compensate for other problems? What does the compensation model (and related perspectives) offer that the addiction model does not? Kardefelt-Winther argued that the compensatory model is better equipped to address the question of *why* problem gamers play games. However, this does not appear to be the case. The compensation model describes motivations that are reported by *most* individuals (e.g., the social, escape, or immersive elements); hence, the model lacks specificity in describing its key variable (motivation) that relates to harm. At the same time, the compensation model is relatively sparse, lacking the clinical detail from decades of research and observations of problematic gaming from the addiction perspective.

The compensation model is less useful for explaining the differences between normal and problematic players. For example, two individuals may report that they play games to cope with stress—how, then, would the compensation model determine which is problematic? The model cites the concepts of "unhealthy motivation" and "negative life situations". However, these concepts are not as useful (i.e., clinically meaningful) as other concepts in the addiction model, nor do they offer much insight into the progression from healthy to unhealthy use. Practically, "compensatory use" as a term for practitioners is "fuzzy" or too open to interpretation to adequately explain problem behavior on its own merits.

Another similar counterproposal to IGD that has eschewed addiction concepts warrants discussion in this context. A paper by Kardefelt-Winther et al. (2017) proposed a new definition of behavioral addiction with the aims of: (1) reducing the potential for new disorders of questionable clinical validity being proposed and (2) improving the classification of behaviors known to be harmful, including gambling and gaming. The definition was:

> *A repeated behavior leading to significant harm or distress. The behavior is not reduced by the person and persists over a significant period of time. The harm or distress is of a functionally impairing nature*
>
> *(p. 1710).*

This definition emphasizes harm, which is essential to the IGD/GD classifications (Billieux et al., 2015), and the authors intended their definition to be "open source" to invite further input and updates from other researchers, which is commendable. However, there are several major caveats. First, this definition has *wide-ranging scope* and could refer to many mental disorders that involve a repeated behavior, including obsessive-compulsive disorder (i.e., rituals), bulimia nervosa (i.e., frequent bingeing and purging), and hoarding disorder (i.e., accumulating objects). By leaving out concepts that are usually agreed to be central to the experience of behavioral addiction, such as impaired control (which is not mentioned explicitly in Kardefelt-Winther et al.'s (2017) paper), the resultant definition is far too broad to be clinically useful.

In addition, as noted by Griffiths (2017), this proposed definition may serve to "open the floodgates" to even more behaviors being classified as addictive. At the same time, with its accompanying exclusion criteria (that refer to "coping" and making "wilful choices"), the definition may prevent many individuals with substance-based disorders from being classified as addictions—in effect, the definition may achieve the opposite of what it sought to do.

Returning to the question: Why are some researchers critical of the concept of pathological gaming and propose substitute concepts (while removing others)? It seems to us that there are many researchers active in the field of behavioral addiction who tend to adopt a contrarian stance, particularly in relation to gaming issues. Reasonable doubt is valuable in all fields of science. Kardefelt-Winther, for example, have written many insightful and stimulating papers on the challenges faced by the field as it continues to grow and seek legitimacy among other disorders. We share his concern, for example, that the field of behavioral addictions may be threatened by premature acceptance of new conditions that divert attention from more serious health issues. However, it is clear, too, that some authors' commentaries on IGD and related areas may be characterized less as science-based and more as "sound and fury", but these works may still serve to motivate researchers in strengthening their views and assumptions. We agree, too, with concerns expressed by Petry et al. (2016) that the field can often be too concerned with debate for its own sake, which may hinder progress in important areas.

There may also be some less scientific reasons as to why some researchers are strongly opposed to IGD and its concepts. We might speculate that some authors prefer concepts such as "coping" because it provides a means of diluting the concept of problematic gaming. "Compensation" is diffuse and shifts attention away from player-game interactions to other issues. It turns the concept into *problematic* [coping by] *gaming*, suggesting that gaming is an unimportant variable. The opposition to gaming as addictive may possibly stem from some researchers' own interests in gaming (i.e., a positive bias toward gaming). For example, IGD may be opposed because it is viewed as a threat to the notion of healthy gaming or to the gaming industry's commercial interests. These possibilities will be discussed more in later chapters in relation to *overpathologizing* (Chapter 5) and *moral panic* (Chapter 9).

The need for a behavioral analysis

A recurring theme of this chapter has been the conceptual relationship between IGD and gambling, as well as other addictive disorders. Many studies on problem gaming have assumed that problem gambling screening tools may be almost entirely suitable for these behaviors. Having presented some of the theoretical models of IGD, it may be useful to reconsider this gaming-gambling relationship in light of the proposed importance of reward-seeking and conditioning processes in IGD models. To what extent is it fair to assume, for example, that gaming and gambling are comparable in terms of their schedules of reinforcement? According to James and Tunney (2017a), these two activities are often mistakenly assumed to be much more similar than they really are. Both activities share some randomness and have variable rewards, but they are also very different in many ways. They have called for researchers to recognize the heterogeneous nature of gaming and gambling activities (e.g., different mechanics and features), on the basis that some "concepts from gambling appear to be more relevant for aspects of mobile gaming than for video games more generally" (p. 306).

In another paper, James and Tunney (2017b) argued that it is necessary to understand where the positive and negative reinforcement in gaming activities actually comes from (e.g., whether it comes from the activity itself or from general contextual cues). This may help to determine more precisely whether and when gaming is similar to gambling. The authors explained that some games that are known to be quite addictive, such as real-time strategy games (e.g., *Starcraft* in South Korea), do not have many of the same schedules of reinforcement as electronic gambling machines—in contrast, these games are much more strategic and goal-oriented. Understanding gaming stimuli in more detail using behavioral analysis may have implications for models of Internet use disorders, such as the acknowledgement of reward-based differences in gaming vs gambling behaviors, as well as gaming activities with "gambling-like" features (Gainsbury, Hing, Delfabbro, & King, 2014).

Taking a stance on IGD and gaming

The position of this book is that the *best available evidence* suggests that gaming should be viewed as a behavioral addiction. Further to this, it is important to consider gaming along a continuum that extends from healthy to hazardous and harmful to pathological behavior. The majority of people who play video games are casually (i.e., infrequently or irregularly) involved and, for these individuals, gaming may be considered an adaptive and temporary diversion from reality. Many people experience a range of benefits from gaming. There is a subgroup of players who may be termed gaming enthusiasts, who are identified as "gamers" (as distinct from "someone who plays games") and often spend around 20–30 h per week playing games without meeting any IGD criteria. Similarly, there are leagues of professional

gamers (i.e., individuals paid a salary to compete against others or to entertain an audience). Many within this population may also tend not to endorse IGD criteria.

Finally, there is a proportionately small group of players who experience problems or are at risk of experiencing problems, to varying degrees, as a consequence of their gaming behavior. Some of these users may be considered to be "misusing" games, or to be engaging in "hazardous" or "harmful" gaming. The distinction refers to the degree of risk associated with the behavior and the severity of the functional consequences. Hazardous gaming behaviors are often driven by consequences, rather than the progressive brain changes that occur in pathology. Finally, in some rare cases, individuals may be considered as addicted to games when they meet the requisite criteria—specifically, they demonstrate impaired control over their gaming that results in functional impairment. In this way, it is possible to recognize that gaming can enhance the lives of many people, while identifying that it is destructive for other individuals. Healthy gaming and gaming disorder are mutually exclusive, but completely compatible concepts.

Summary: Human modeling

The concept of gaming as an addictive disorder originated from spirited attempts to imitate other disorders, such as pathological gambling and substance use disorders, much like some species of animals have thrived by mimicking the similarities of others. Chief among these similarities have been the concepts of impaired control, and more controversially—tolerance and withdrawal. For many years, problem gaming was thought to be almost identical to problem gambling. However, this mimicry—rather than offering protections of some kind—has arguably attracted some critics who have claimed that the theorized disorder, or some of its criteria, should be completely discarded. Attacks on the conceptual foundation of what would later become IGD in the DSM-5 may have been the necessary stimulation for research needed to affirm its status as a serious condition.

Hundreds of studies using both nomothetic and idiographic approaches, including major epidemiological and neuroimaging studies, now support the existence of problematic gaming and IGD. It was, perhaps, only a matter of time before gaming disorder was revealed by researchers and clinicians to be largely similar to its initial mimicked form. However, there may still be some updates and refinements to the IGD classification in the years ahead. While the concept of addiction in general continues to attract debate, the concept of gaming as a mental disorder is gaining acceptance in clinical nomenclature, particularly in the ICD-11.

This chapter has shown that sophisticated IGD models have been developed in the last few years, based on credible and converging multi-disciplinary evidence that shows IGD has distinct psychological characteristics with identifiable biomarkers. While some model factors and relationships warrant further study, these models are valuable in guiding the practical tasks of screening and individual case formulation.

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Risk and protective factors for IGD

3

Chapter Outline

Introduction and overview

Many millions of people play games for positive reasons. This includes playing games in moderation for fun, to relieve stress, and to socialize with others. Many players report that they appreciate games in ways that seem comparable to how other individuals enjoy film, television, and literature—or other cultural products, including artwork, heritage conservation, or festivals. Mutual appreciation for certain gaming experiences will often lead players to connect with others for company and to fulfill shared goals. For example, the popular augmented reality game, *Pokémon GO*, has facilitated large social gatherings and cooperation in public places (Kain, 2016). The game also reportedly provided the practical means for some shy and socially withdrawn individuals to develop more social confidence, improve their mood, and make friends (Grohol, 2016; Tateno, Skokauskas, Kato, Teo, & Guerrero, 2016).

Positive social experiences are often reported by gamers in the context of online gaming, as well as within the interactions that occur on other media platforms that facilitate the gaming community's online presence (e.g., websites, social media,

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mobile apps). The online gaming community is made up of many individuals who tend to group together according to their preferences for certain gaming platforms and/or game franchises. Gaming-related forums enable these users to observe and participate in conversations on topics germane to their gaming interests. It also enables them to discuss their gaming loyalties, successes, and related experiences. In addition, some individuals enjoy following other players on online gaming chat channels (e.g., *Twitch*, *YouTube Gaming*) or other social network sites. There are also online news outlets dedicated to game critique and forecasting new gaming developments (e.g., *IGN.com*, *Gamespot.com*) that provide another online meeting point for gamers to share and discuss gaming-related issues.

Gaming also brings many players together in the real world. In some regions, major gaming conventions and expos are "sold out" events held in large auditoriums like popular concerts. Tens of thousands of gaming fans will congregate to share their enjoyment of gaming, buy gaming paraphernalia, and interact with the industry. Such events will sometimes include community benefits such as the donation of profits to children's charities and related causes. Similarly, in countries such as South Korea, professional gaming (eSports) events are regulated and have a substantial following, often hosted in large stadiums, and are comparable in this way to other organized sports. It is clear, from these developments, that online gaming has become a major cultural pastime that has integrated into many areas and conventions of daily life, with the effect of enhancing the lives of many of its observers and participants.

The massive popularity of gaming worldwide, including the rise of gaming subcultures, is relevant to our discussion of problematic gaming and gaming disorder because it underlines an important point: *Gaming is very popular, but very few individuals will ever experience significant gaming-related problems.* Therefore, one must examine not only the gaming products and activities (as well as "gaming culture"), but also the individuals and their social context to explain why this small fraction of users develop persistent gaming behaviors that result in harmful consequences. Gaming is *not* universally harmful to all users. Unlike tobacco, for example, it is not an inherently unhealthy activity and, as noted above, it can have some benefits (Przybylski, Weinstein, & Murayama, 2016).

Our understanding of gaming-related problems and gaming disorder is based on conceptual models (e.g., Brand, Young, Laier, Wölfling, & Potenza, 2016) that emphasize the role of *multiple* contributing factors to gaming harm, including the psychological characteristics of the user that underlie certain vulnerabilities to developing problematic gaming behavior. Not all vulnerable players become addicted to all games, just as all games with addictive features do not lead their entire player base to become addicted. Harms arise via the *interaction* of the vulnerable player and the properties of the addictive product, as we have learnt from decades of research in the field of problem gambling (Clark, 2015; Korn & Shaffer, 1999).

This chapter aims to expand on the previous chapter on IGD theories and models by discussing in more detail some of the known characteristics of *individuals* (e.g., demographic, personality, comorbidity, and neuropsychological features); *external factors* (e.g., family-related, environmental, and social variables); and *game-related* factors (i.e., the structural design of games) that may influence risk of IGD. There are also

"protective" factors for IGD that are not simply the absence of risk factors, but instead refer to traits and other variables that "inoculate" or promote resilience in individuals, thereby protecting against the effects of exposure to risky activities, peer influences, and other contributing factors.

Although much of the guiding evidence in this area is based on cross-sectional research, some longitudinal studies have shown that certain factors may predict the greater likelihood of IGD symptoms being maintained over time. This work has led to the identification of IGD profiles, which guides improvements to a range of intervention and harm reduction efforts.

How does gaming actually cause harm?

While IGD is a type of behavioral addiction that shares many of its defining criteria with gambling and substance use disorders, gaming as an activity is not quite as comparable to these addictive behaviors in terms of the user experience. Video gaming differs, for example, from playing poker or consuming alcohol, in terms of how it is consumed and the potential consequences for players. For example, a problem gambler often experiences *financial losses*, which cause emotional distress and major life difficulties (e.g., conflict with a partner, loss of material assets, legal issues, bankruptcy, or loss of employment). An alcoholic will experience similar interpersonal stressors and harms, in addition to *negative effects on health and well-being*, including heart disease, brain and liver damage, memory and attention problems, and the increased risk of physical injury while intoxicated, among many other health-related issues. Such problems are rarely, if ever, reported by people affected by IGD.

So, how does IGD differ and in what ways does it harm players? It is true that, like gamblers, some gamers may spend much of their income on gaming activities, but such financial expenditure is unlikely to ever rival that expended by problem gamblers. Some gamers may spend too much on gaming-related purchases, such as accruing debts on credit cards (particularly in the case of adolescents with access to parents' finances), and some players may "chase losses" in the sense of spending money impulsively on monetization features in games to improve their playing performance. In support of this view, gamers will often highlight the relatively low costs of their gaming compared to other activities, after the initial purchase of gaming equipment. Gaming may be seen to cost very little when costs are expressed as a function of expenditure divided by time spent playing (King, Kaptsis, Delfabbro, & Gradisar, 2016).

Unlike substance misuse and addiction, the negative health effects of persistent gaming are relatively mild. The most typically observed health-related "harms" of gaming include loss of weight due to restricted diet (or weight gain due to overeating); physical pain issues due to poor posture and repetitive strain injuries; and restricted and poor sleep and/or reverse sleep-wake cycle that results in fatigue and lethargy (Männikkö, Billieux, & Kääriäinen, 2015). In rare cases, gaming can produce photosensitive seizures (Chuang, 2006), but susceptible users are likely to tend to avoid games that produce this reaction.

The primary way in which pathological users are negatively impacted by their gaming relates to the *extreme time investment* in gaming (i.e., 8–12 h per day) (Baggio et al., 2016). Time spent gaming results in missed opportunities and the interference with, and displacement of, normal routine and functioning, including *basic activities* (i.e., sleep, eating, personal hygiene); *real-world social interaction* (i.e., talking to people, meeting friends face-to-face, visiting family); and *important responsibilities* (i.e., school, work, care of pets, and children).

A gaming disorder markedly changes the user's *priorities*, which results in greatly diminished interest in, and capacity to, attend to non-gaming-related information, people, and events. The affected individual becomes increasingly less able and less motivated to regulate gaming time. Consequently, the user *neglects* the real world and his or her roles within it. A wide range of negative outcomes follow this indifference and detachment from reality. A habitual pattern of gaming creates an expanding "void" in the person's life, where progression in important life areas, such as school or career, becomes anchored to the time at which gaming began. Over time, the individual may find it increasingly more difficult to resume their involvement in other activities, due to loss of self-efficacy and/or deterioration of skills.

When not playing games, the individual with IGD is often preoccupied with gaming, consumed by thoughts of future gaming intentions and opportunities. The user may increasingly show less care about, or attention to, their present reality and non-gaming concerns. Preoccupation reduces the availability of cognitive resources for non-gaming tasks, which results in not learning at school, not completing work tasks efficiently or not completing them at all, and not interacting meaningfully with others.

The lack of positive reinforcement and success in non-gaming areas further leads the user to retreat into gaming activities. Within a short period of time (i.e., <3 months), the user may experience negative consequences such as failing at school, reprimands or lost productivity at work, and/or arguments with family or a partner. Negative mood states (i.e., usually irritability, sadness, and boredom) accompany the times when the individual is not playing or is less able to play. Such feelings may be amplified by other mood changes linked to poor diet and lack of sleep—which results in the user becoming more detached from the real world and seeking gaming for the relieving effects of play.

Thoughts of gaming for the user tend to be more automatic and require less mental effort and are more pleasant than thinking about real-world matters. Thoughts about oneself and the quality of life outside of gaming may be very painful and lead to suicidal ideation (Wu, Lee, Liao, & Chang, 2015). Such thoughts will often be "blocked out" by gaming-related behavior (e.g., browsing gaming websites). Individuals affected in this way can become less patient and respectful toward others and may come to view people as obstacles or interruptions to gaming.

The user will regularly take "shortcuts" (i.e., actions that require the lowest effort) to continue or maintain their gaming. The prioritization of gaming develops a pattern of behavioral avoidance (e.g., school truancy, "sick days" from work, avoiding social meals), not necessarily due to anxieties although they may also be present, but primarily with the intention of limiting the amount of time spent away from the

gaming device. When unable to play, the user experiences distress or *anhedonia*, as though experiencing a loss or deprivation of purpose.

Many of these behavioral and cognitive changes that produce harmful outcomes can be understood as stemming from the functional brain changes that occur in the context of pathological gaming. Reduced self-regulation due to altered brain states leads to the prioritization of gaming-related stimulation that develops a highly time-consuming and inflexible gaming routine that significantly interferes with normal functioning, including severe neglect of oneself, other people, and the real world. In short, gaming consumes reality.

Individual differences

People play games differently and vary in their natural interest in gaming activities. These individual differences play an important role in the development of problematic gaming behaviors. Some individuals are more at risk of IGD due to personal characteristics, some of which may be *modifiable* (e.g., by intervention or other strategies), such as maladaptive beliefs or mood imbalances, whereas others may not be, such as genetics or upbringing.

Many of these factors are related. For example, individuals with attention deficits may underperform in school and therefore develop low self-esteem. These factors influence how the individual tends to perceive and react to games and other gaming-related stimuli, including their perception of the costs and benefits of gaming. These individual differences can be of several different types which operate at different levels or in combination. Some may be demographic; some are psychological (e.g., personality differences, comorbidity), whereas some may be neurobiological in nature.

Gender

Males are generally understood to be at greater risk of developing IGD (Andreassen et al., 2016). Studies have shown that IGD prevalence favors males by a factor of at least 2 to 1 (Durkee et al., 2012; King, Delfabbro, & Griffiths, 2012; King, Delfabbro, Griffiths, & Gradisar, 2012). Males' greater risk of IGD is not only due to their proportionately higher level of participation in gaming, but also because males are more likely to engage in riskier games, such as competitive shooters and massively multiplayer online games. While many females do play these popular online games (including many of the same games), and the overall gender ratio in the gaming market is becoming more evenly balanced (Brand, Todhunter, & Jervis, 2017), males still tend to report playing games more *frequently* (i.e., on more days of the year) and *intensely* (i.e., for longer periods of time) than females.

One reason for this gender difference may be that many games have been developed primarily by males for males, with game modes and features (e.g., competition, territorial invasion, violence, and domination) and aesthetics (e.g., sexualized images of women, crude humor) that are generally more appealing to males, particularly adolescents.

However, the gaming industry is not exclusively male interest-driven—it is increasingly broadening the content of games and more females are entering the business as game developers and other roles, which will likely result in more games being tailored to and inclusive of the preferences of women.

There are also many games that appeal more strongly to female players, including social games, story-driven, and casual games; however, these types of games are often less time-consuming and risky. Finally, males are more at risk of IGD than females due to their greater tendency for other underlying concerns, such as specific *personality issues* (De Bolle et al., 2015; Grijalva et al., 2015), *attention problems* (Gershon & Gershon, 2002), *risk-taking* (Byrnes, Miller, & Schafer, 1999; Sariyska, Lachmann, Markett, Reuter, & Montag, 2017), *impulsivity* and *sensation-seeking* (Cross, Copping, & Campbell, 2011), and *lack of help-seeking tendencies* (Addis & Mahalik, 2003).

Age

Adolescence, usually defined for convenience as the period between 12 and 18 years, is the most vulnerable time for the acquisition of addictive disorders, including gaming (Gentile et al., 2017; Gentile, Berch, Choo, Khoo, & Walsh, 2017; Tejeiro, Gomez-Vallecillo, Pelegrina, Wallace, & Emberley, 2012). This vulnerability arises due to *neurological* (i.e., developing prefrontal cortex, which is responsible for decision-making and controlling impulses), *developmental* (i.e., resolving needs for social belonging and identity, and challenging authority), and *cultural* (e.g., stressful transition to secondary school, new responsibilities, and greater independence) reasons.

Studies of problem gaming and IGD have shown that gaming is typically more frequent during adolescence (Brand et al., 2017) and may, therefore, become relied upon as a means of coping with various physical and psychological changes and new role expectations. Gaming activities may be more likely to cause interference during periods of high stress and performance demands in middle-to-late adolescence (e.g., secondary school examinations) and into young adulthood (e.g., entering the workforce, formation of adult relationships).

Throughout and beyond late adolescence, many young people in industrialized societies are often living at home (Ayllón, 2015; Bayrakdar & Coulter, 2017) with supported access to gaming in their bedroom or living room. Given that age appears to have an inverse u-shaped relationship with problematic gaming, the risk of developing problem gaming and IGD will usually decrease as individuals enter their late 20s (Kuss & Griffiths, 2012).

Personality traits and personal characteristics

Studies have identified personality factors and psychological characteristics linked to IGD, including *impulsivity* (Billieux et al., 2015; Lee et al., 2012; Rho et al., 2017); *neuroticism* (Peters & Malesky, 2008); *introversion* (Cole & Hooley, 2013); *lower agreeableness* (Collins, Freeman, & Chamarro-Premuzic, 2012); *lower conscientiousness* (Braun, Stopfer, Müller, Beutel, & Egloff, 2016); *low openness to experience*

(Wang, Ho, Chan, & Tse, 2015); *aggressiveness* (Gervasi et al., 2017); *rule-breaking* (Müller et al., 2015); *trait anxiety* (Mehroof & Griffiths, 2010); and *narcissism* (Stopfer, Braun, Müller, & Egloff, 2015).

A study by Walther, Morgenstern, and Hanewinkel (2012) examined the Big Five personality traits and other characteristics across five different addictive disorders, including gambling, gaming, use of tobacco, alcohol, and cannabis, in a sample of 2553 people aged 12 to 25 years. They reported that high impulsivity was the only cooccurring personality factor present in all five disorders, with a secondary analysis revealing that problematic gaming was specifically associated with the characteristics of irritability/aggression, social anxiety, attention deficit issues, and low self-esteem. Protective factors have been identified as *low impulsivity* (Collins et al., 2012), *high conscientiousness* (Müller, Beutel, Egloff, & Wölfling, 2014), *high extraversion* (Kuss, Van Rooij, Shorter, Griffiths, & van de Mheen, 2013), and greater *emotional regulation* (Liau et al., 2015).

Comorbidity

A major contributing factor for IGD is comorbidity (Laconi, Pirès, & Chabrol, 2017; Sioni, Burleson, & Bekerian, 2017; Wang, Cho, & Kim, 2018). Theoretical models of IGD refer to mood symptoms and disorders, including depression and anxiety disorders, as a major component of the individual's preexisting vulnerability to the disorder (Brand et al., 2016; Davis, 2001). Over the last two decades, there has been a great deal of research on the link between "Internet addiction" and psychopathology (e.g., Ha et al., 2007; Ho et al., 2014; Ko et al., 2014; Yen, Ko, Yen, Wu, & Yang, 2007; Yen, Yen, Chen, Chen, & Ko, 2007; Young & Rogers, 1998), with some of this work including a focus on online gaming activities (Andreassen et al., 2016; King, Delfabbro, Zwaans, & Kaptsis, 2013).

Links between comorbidity and IGD have also been evaluated in clinical samples (i.e., IGD treatment-seekers). For example, in a study of 263 patients with IGD and 153 healthy comparison subjects, Hyun et al. (2015) employed a hierarchical logistic regression analysis that included *individual factors* (sex and age), *cognitive factors* (IQ and perseverative errors), *psychopathological conditions* (ADHD, depression, anxiety, and impulsivity), and *social interaction factors* (family environment, social anxiety, and self-esteem). The authors reported that all four factors were significantly associated with IGD, with psychopathological conditions emerging as the strongest risk factors.

Deficient self-regulation and decision-making

Individuals with poor self-regulation and decision-making biases are more prone to developing addictive behaviors, including IGD (Liu & Peng, 2009; Schiebener & Brand, 2017). Studies have identified that problem gamers tend to differ from controls on neurocognitive tasks of attention, processing, and decision-making. For example, problem gamers have biases in how they interpret and process game-related information (Decker & Gay, 2011); they make poorer decisions under risky conditions (Yao et al., 2015); and

they are less able to delay gratification for a larger reward (Pawlikowski & Brand, 2011). These biases derive from a vulnerable neurobiological predisposition and are strengthened with repeated use of the activity (Brand et al., 2016).

The inability to self-regulate often makes individuals' early experimentation with addictive activities a riskier or harmful prospect. For example, these individuals will be more inclined to place large bets when gambling or to play games for longer (Bailey, West, & Kuffel, 2013). A prospective study of 2790 online gamers by Seay and Kraut (2007) examined the variables of video gaming activity, motivations, personality, social and emotional environment, and negative impacts. Deficient self-regulation was the strongest predictor of problem gaming over a 14-month period. They concluded that, while "a player's reasons for playing do influence the development of problematic usage, these effects are overshadowed by the central importance of self-regulation in managing both the timing and amount of play" (p. 829).

Low self-esteem and self-efficacy

Individuals with low self-esteem have less confidence, are prone to self-criticism, and have difficulties in establishing and maintaining friendships. Gaming may, therefore, provide emotional comfort and offer "safer" (e.g., anonymous, asynchronous, and non-face-to-face) social avenues (Kowert, Domahidi, Festl, & Quandt, 2014; Lo, Wang, & Fang, 2005). Models of IGD recognize that individuals who feel less certain in their own abilities and their place in the real world will be more at risk of using the Internet and playing online games to compensate (Davis, 2001; King & Delfabbro, 2014, 2016; Turkle, 2017). Stetina, Kothgassner, Lehenbauer, and Kryspin-Exner (2011) investigated various types of online gamers ($N=468$) and found that problematic massively multiplayer (MMO) game players tended to score higher than other players on measures of depression and low self-esteem. Low self-esteem may, therefore, be a risk factor for excessive engagement in online games that cater to needs for identity and group belonging.

Low self-esteem is also related to the cognitive symptoms of many mental disorders (e.g., thoughts of hopelessness, uncertainty about the future), which are common risk factors for addiction. Similarly, individuals with low self-efficacy tend to perceive that they are unable to be successful in most everyday activities, so they will be drawn to gaming activities that are more structured or guided and will reinforce that the player is skillful or powerful, or employ other affirming language (Jeong & Kim, 2011). Gaming activities tend to require only minimal effort and time for the player to be rewarded with points, medals, trophies, or other symbols of "success." Individuals who struggle to obtain and who rarely receive encouragement or other positive reinforcement in their daily life may be drawn to gaming for this feedback.

Low educational achievement/few other interests

While IGD is defined by gaming behavior that results in major conflict and interference with normal routine, individuals with a preexisting lack of life fulfillment and a lack of varied routine may be more at risk of the disorder. People who do not regularly

experience real-world achievement, including satisfaction from leisure interests, and who play games to compensate are at greater risk of developing IGD. Gaming activities, by design, can cater to any available amount of playing time, with some activities that can be completed in only a few minutes and others that require many hours and can be repeated endlessly.

Some games may be considered analogous to a gas that expands to fill a bottle of any volume. Having not much else to do (e.g., being unemployed) and having few prospects may lead these individuals to choose gaming to fill this time (Hussain, Griffiths, & Baguley, 2012). As more time is expended in gaming activities, it becomes increasingly likely that the player will develop rationalizations to continue gaming in this way, in line with cognitive dissonance theory applied to addictive behavior (McMaster & Lee, 1991).

External factors

Other risk factors include the social and environmental variables that impinge on individuals and direct them toward riskier participation in gaming activities. While many of these factors may exert a strong influence on players and may be perceived by individuals with IGD as largely unavoidable, it is possible for some of these factors to be addressed by interventions or harm reduction strategies. This may involve making systematic changes (e.g., reorganization) of the individual's living arrangement (i.e., to reduce the availability of gaming) or developing new social supports that facilitate healthier activities (e.g., ending toxic relationships and limiting exposure to social enablers of gaming activities).

Peer influences

Many children are raised with access to gaming devices in the family home, according to studies where some participants have reported that their first gaming experience occurred at the age of 5 years (e.g., King et al., 2013, 2018). Young people will also be introduced to gaming through their association with peers, in school or other locales. Individuals who associate with frequent and probable problematic gamers will be at greater risk of IGD due to having more gaming opportunities, having social incentives to play, and being invited to play regularly as part of a group.

Online gaming with "friends" (i.e., real-world or online-only relationships) can give rise to social obligations to play regularly in teams (e.g., "clans" and "guilds"). This form of gaming can often be a significant and unpredictable time commitment, where players may feel under pressure to continue playing until there is a group consensus to quit. It may be difficult to take breaks. Estimating when group-based activities will conclude may not be possible, because success can be determined by random factors, and much time can be spent waiting for other players to prepare themselves for gaming events.

Many types of online social gaming situations will result in playing longer than intended. This may become rationalized as "normal" given that other people are playing

in the same (potentially unintended) way. Team success may galvanize the individual's view that playing longer than intended was "worth it" and the group may collectively reframe the negative outcomes of playing (e.g., fatigue, diminished productivity) as a "badge of honor." Individuals who leave social games before others may feel guilty, or experience "fear of missing out" (see Przybylski, Murayama, DeHaan, & Gladwell, 2013). These players may worry about not maintaining their game level or progression in line with their peers, because this may determine whether they are able to continue playing with the group.

Persistent gaming can impact on real-world friendships. A study by Kowert et al. (2014) found that adolescent players who regularly played social online games tended to have much smaller and lower quality offline social circles. The social displacement effects of multiplayer online games will, therefore, increase the risk of continued gaming behavior, as the player increasingly prioritizes online social obligations over real-world relationships. For this reason, having a network of close friends who do not play games or play rarely, or who tend to play time-limited, casual games (e.g., sports or racing games) together in a shared (real world) environment, as opposed to online play in large groups, could have a protective influence. Individuals with friends with balanced interests (i.e., non-gaming hobbies) and who play games for "fun" or "relaxation" rather than "achievement" will be at less risk of developing IGD.

Gaming environment

Gaming behavior is largely governed by the availability and accessibility of gaming activities (Weis & Cerankosky, 2010). Individuals with IGD often modify their environment to centralize gaming so that it is easier to initiate and maintain play. Studies show that individuals with greater access to gaming tend to play longer and more often. This connection is evident, for example, in the literature on electronic devices and sleep patterns in adolescent populations. Adolescents who have electronic media devices in the bedroom tend to report later bed times, shorter sleep duration, longer sleep-onset latency, and worse daytime functioning (e.g., worse memory or concentration), as compared to those without devices in their bedroom (Brunborg, Mentzoni, Molde, et al., 2011; Li et al., 2007; Oka, Suzuki, & Inoue, 2008; Punamaki, Wallenius, Nygard, Saarni, & Rimpela, 2007; Schochat, Flint-Bretner, & Tzischinksy, 2010).

In a recent study involving three longitudinal datasets, Gentile, Bailey, et al. (2017) and Gentile, Berch, et al., 2017 reported that children with bedroom media were more likely to use devices than read books and were at greater risk of developing IGD. Similarly, our study of 1287 adolescents found that individuals with symptoms of pathological media use were more likely to report sleep problems (e.g., delayed sleep-onset, interrupted sleep, lower sleep quality) than normal users (King, Delfabbro, Zwaans, & Kaptsis, 2014). It is possible that there is a cyclic relationship where individuals with poorer sleep habits use devices as a sleep aid, which in turn delays and worsens sleep. Restricted access to gaming, and gaming only during daylight hours, is therefore likely to be protective (King, Delfabbro, & Griffiths, 2012; King, Delfabbro, Griffiths, & Gradisar, 2012).

Familial influences

Family structures and relationships play a complex and important role in the development of problematic gaming (Choo, Sim, Liau, Gentile, & Khoo, 2015). Several familial influences, such as the parent-child relationship, parental restriction and monitoring of media use, and parents' marital and socioeconomic status, may affect the likelihood that an adolescent becomes a problem gamer (Schneider, King, & Delfabbro, 2017). For example, adolescents from single-parent or blended families are reportedly at greater risk of problem gaming than those from two-parent families (Lam, Peng, Mai, & Jing, 2009; Yen, Ko, et al., 2007; Yen, Yen, et al., 2007).

Research has examined adolescent electronic media use and family functioning variables, with much of this work conducted in East Asia (Xiuqin et al., 2010). For example, Chiu, Lee, and Huang (2004) reported that Taiwanese youth from families with higher functioning relationships had much lower levels of problematic gaming. Similarly, a study of 600 adolescents by Jeong and Kim (2011) reported that lower engagement in family activities was associated with problematic gaming. A 5-year longitudinal study by Rehbein and Baier (2013) reported that increased paternal devotion and higher parental supervision in childhood predicted lower rates of problem gaming in adolescence. Similarly, adolescents with IGD tend to report significantly less trust and communication, and greater anger and alienation, in their maternal and paternal relationships than adolescents without gaming problems (King & Delfabbro, 2018).

Individuals from less stable and less warm families may be more at risk of problematic gaming and other online activities that enable an "escape." Positive family functioning may be protective against IGD because more diligent family members are likely to direct the adolescent's attention away from games and toward other activities (Kim & Kim, 2015). Secure family relationships are also likely to help buffer against other risks, including mental health issues and stressful life events (Allen, Porter, McFarland, McElhaney, & Marsh, 2007; Laible, Carlo, & Raffaelli, 2000).

Relational trauma

Insecurely attached adolescents may seek out the security and emotional comfort of virtual worlds and relationships in online games (Milani, Osualdella, & Di Blasio, 2009). The use of gaming to satisfy relationship and emotional security needs may develop into a pattern of avoidance and/or heightened conflict with parents and peers. Some research has reported that some adolescents with relational trauma histories play online games as a way of dealing with painful memories related to early parent-child experiences.

A study by Schimmenti, Passanisi, Gervasi, Manzella, and Fama (2014) surveyed 310 students aged 18–19 years to assess problematic Internet use and relational trauma. They found that problematic users were significantly more likely to have suffered childhood experiences of physical and sexual abuse and scored higher than other participants on scales assessing anxious and avoidant attachment attitudes. Another study by Schimmenti, Guglielmucci, Barbasio, and Granieri (2012) surveyed 250 adult players of MMO games to examine attachment profiles in relation to addiction

symptoms. Almost half (47%) of the problematic gamers reported features of disorganized attachment and playing to escape from painful memories of abuse. Conversely, parental warmth and secure relationships have been found to be protective against addictive behaviors. A 2-year longitudinal study of 3034 adolescents by Liau et al. (2015) reported that parent-child connectedness and warm family environment were related to a decrease in pathological gaming symptoms.

Gaming-related factors

A final class of risk factors refers to the characteristics of games associated with the initiation, development, and maintenance of gaming behaviors (Griffiths & Nuyens, 2017). As noted in Chapter 1, there are many diverse gaming products and services, which vary in their potential for problematic involvement. A common feature of more addictive games is their *never-ending* nature (i.e., replayability and limitless rewards). Research has identified MMO games (Caplan, Williams, & Yee, 2009) and competitive shooters (Rehbein, Kleimann, & Mößle, 2010) as genres associated with IGD. However, it should be noted that many of the features typical to these games (e.g., leveling systems, open worlds, and online groups) are becoming increasingly incorporated into other gaming genres, including story-driven adventure, puzzle, sports, and racing games. This genre "hybridization" means that, over time, many new games may tend to be less distinct and have more in common with MMO and role-playing games.

Types of games

Online games are generally recognized as being more risky than offline games. Online connectivity enables not only the ability to play with or against other players, but also allows the developers of the game to introduce new features, updates, and content, ensuring the game can offer novel experiences to the player. Games also differ by genre with categories not dissimilar to those observed on book shelves or in the movie world, although there are some game classifications (e.g., shooting, role-playing, strategy) that are more specific to gaming (James & Tunney, 2017).

A recent study of 418 gamers by Laconi et al. (2017) reported that different game genres were associated with a variety of motives to play, and that problem gaming was associated with higher social, escape, fantasy, and coping motives than normal play. A study by Eichenbaum, Kattner, Bradford, Gentile, and Green (2015) surveyed 4744 university students and found that real-time strategy and role-playing games were more strongly associated with IGD symptoms, as compared with action-style and other games (e.g., phone games). Therefore, some interactions of players with certain types of games may be riskier than others. Problem gamers are often able to recall a "special" game that other games may be measured internally against. These players may report seeking out new games in the hope of replicating the experience of this game, in much the same way that problem gamblers attempt to relive their first "big win."

Some studies have shown that certain types of games may have greater potential for interference with daily activities in their own right. For example, a randomized

controlled study by Smyth (2007) involved assigning gaming-naïve participants to different types of games, including an arcade, console, single-player, or MMO game. They instructed participants to play for a short period of time each week, and then they were free to play as much as they desired. At 1-month follow-up, participants assigned to the "MMO game" condition reportedly spent more time playing and had worse health, worse sleep quality, and greater interference in "real-life" socializing and academic work than players of all other games.

Game features

Video games are complex play objects. Like gambling activities (see Schüll, 2012), it is generally agreed that games have certain features that tend to maintain players' interest and encourage them to continue playing. Many of the same features that make games enjoyable (e.g., interactivity, action, and novelty) are likely to also contribute to the development of IGD. For example, the ability to *save progress* in a game enables players to develop a greater sense of investment in their in-game actions.

Game features of this nature were investigated in a psychological study by Wood, Griffiths, Chappell, and Davies (2004). In their study, they examined features including (but not limited to) sound, graphics, background and setting, duration of game, rate of play, and advancement rate. A total of 383 gamers were surveyed about which features they thought were linked to problematic play. It was found that the most important characteristics were rapid absorption rate, character development, the ability to customize the game, and multiplayer features. These findings were consistent with a later study that also surveyed online gamers (King, Delfabbro, & Griffiths, 2011). This study reported that reward features, such as earning points, finding rare game items, and rapid loading times, were rated among the most important aspects of gaming among problematic gamers. Table 3.1 provides a summary of some of the basic structural features of online video games.

Although research suggests that in-game rewards may influence gaming behavior, the actual reward types and their integration with schedules of reinforcement may be context-specific and their effect on player motivation and behavior may differ across games (King, Herd, & Delfabbro, 2017). What is "rewarding" in one game may be unsatisfying or frustrating in another. One feature in a game (e.g., a "raid" activity) may serve different players in different ways. It may, therefore, be difficult to apply a general reductionist approach to the study of structural features in games, particularly when features may be desirable only in combination with other features and only within certain games. Relatedly, a study by Billieux et al. (2013) reported that problematic gaming was associated with multiple different motives, suggesting that the psychological effects of some game features may depend on players' goals.

Notwithstanding these complexities, many would generally agree that gaming reward systems that employ *partial reinforcement,* balancing the user's excitement and boredom or frustration levels (Wan & Chiou, 2006) with a mix of *familiar and novel rewards* (Ko et al., 2009), are likely to contribute to the development of problematic gaming in vulnerable users.

Table 3.1 A list of common video game structural characteristics (King, Delfabbro, & Griffiths, 2010)

Feature type	Sub-features	Example
Social features	Social connectivity features	Voice and text chat, gestures
	Groups and social institutions	Guild/clan membership
	Leaderboard, ranks	High score lists
	Supporting networks	Online forums
Manipulation and control features	User input features	"Combos," "hot-keys"
	Save features	Checkpoints, "quicksave"
	Player management options	Resources and inventory
	Noncontrolled features	Scripted events, loading screens
Narrative and identity features	Avatar creation	Choice of sex, race, attributes
	Interactive narrative	Dialogue/moral choices
	Storytelling device	Cutscenes, mission briefing
	Theme and genre features	"Role-playing," "shooting"
	Character development	Character alignment/status
	Character customization	Clothing, tattoos, hairstyle
Reward features	General rewards	Experience points, bonuses
	Punishment features	Losing a life, restarting a level
	Meta-game reward features	Achievements, trophies, emblems
	Intermittent reward	Randomized loot
	Negative reinforcer	Removing "debuff," sickness
	Near miss features	Failure during final encounter
	Event frequency	Short rounds, content reset
	Event duration	Unpredictable encounters
	Payout interval features	Daily reward feature
Presentation features	Graphics and sound features	Realistic lighting, exciting music
	Animation	Avatar-world interaction
	Franchise features	Trademarked properties
	Explicit content features	Violence, drug use, nudity
	In-game advertising features	Real-life brands, sponsors logos

Profiles of problem gamers

Some recent research has attempted to classify subtypes of IGD gamers according to symptom severity and some of the above noted characteristics. A study by Faulkner, Irving, Adlaf, and Turner (2015) surveyed 3338 adolescents using the Problem Video Game Playing (PVP) scale, a 9-item measure that employs comparable items to the IGD criteria. The researchers also assessed physical and mental health measures to examine their association with IGD severity. Using latent class analysis, the researchers extracted a 4-class model, which included the following groups ranked according to symptom severity: (1) *Severe* PVP players, (2) *High* PVP players, (3) *Low* PVP players, and (4) *Normative* players. Fig. 3.1 presents a summary of the four groups' endorsement of the nine PVP items.

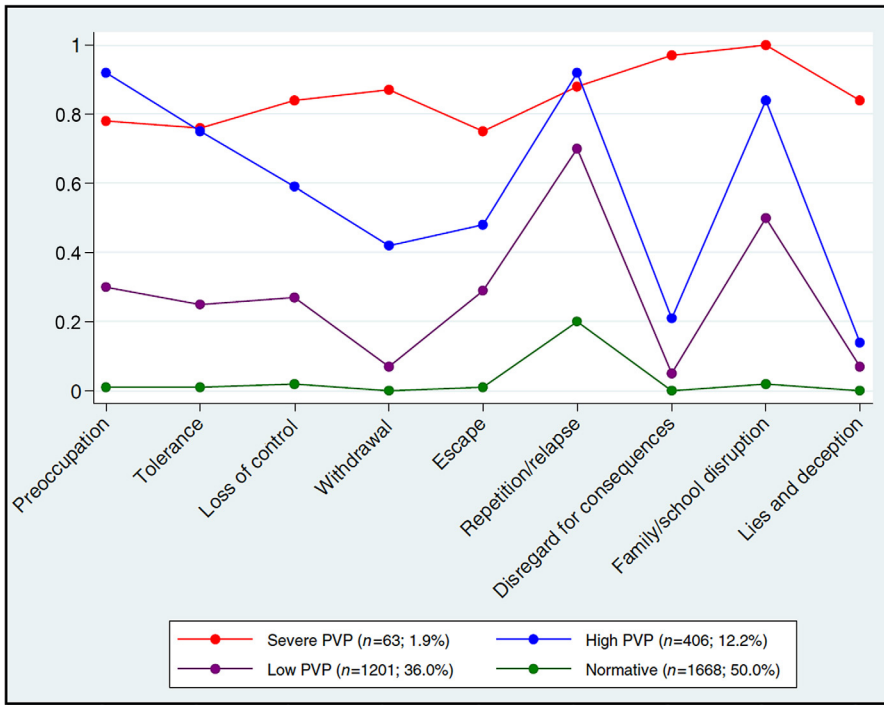

Fig. 3.1 Four subtypes of adolescent problematic gamers (Faulkner et al., 2015).

The Severe PVP subtype was characterized by having the highest probabilities of endorsing all nine PVP items. The High PVP subtype was differentiated from the Severe PVP subtype by having lower probabilities of endorsing the disregard for consequences and the lies and deception items and moderate probabilities of endorsing withdrawal and escape items. The Severe PVP subtype had significantly poorer physical and mental health (i.e., depression and anxiety) outcomes as compared to the other subtypes.

Faulkner et al.'s study demonstrated that problematic gaming was heterogeneous, and that symptom severity tends to fall along a continuum. Only a minority of users (i.e., 1.9% in the study) appear to be severely affected by gaming, with meaningful associated declines in health-related functioning. However, there are other, quite large subgroups of affected individuals who report a smaller number of negative impacts. Faulkner et al. concluded that researchers and clinicians should exercise caution in their use of IGD screening tools, given that some items (e.g., "disregard for negative consequences" and "lies and deception") may be much better at differentiating clinical cases than others (e.g., "repetition/relapse").

Another subtyping study was conducted by Billieux et al. (2015), who surveyed 1057 gamers who played the MMO game *World of Warcraft*. The researchers administered measures of common risk factors (i.e., impulsivity, motives, self-esteem) and gaming outcomes (i.e., addiction symptoms, positive and negative affect). The researchers also

assessed time spent gaming using self-report items in combination with objective behavioral tracking data. Using latent class analysis, the authors identified five subtypes of gamers, including three unregulated (i.e., *problematic*) subtypes and two regulated (i.e., *nonproblematic*) subtypes. The subtypes differed in their psychopathology, motives, and adverse consequences of gaming. The first nonproblematic subtype (*Recreational gamer*) was characterized by low impulsivity and high self-esteem, and lower time spent gaming. The second nonproblematic subtype (*Social role-player*) was characterized by low self-esteem, low impulsivity, and motivations related to social exchange and role-playing. The researchers suggested that this subtype's low self-esteem might be related to identifying with an avatar or an "idealized virtual self" with which the individual would socialize with others in the virtual world.

Billieux et al.'s first problematic subtype (*Escaper*) was characterized by low achievement and high escapism motives, as well as poor self-esteem. This subtype also reported high impulsive traits but scored lower on sensation-seeking, in line with the notion that the individual used games to relieve negative mood states. The second problematic subtype (*Achiever*) was characterized by high impulsivity facets. This player was primarily motivated by gaming achievements and in-game progression and was less interested in role-playing, socializing, or playing to escape reality. The final problematic subtype ("*Hardcore*" *player*) reported the most negative consequences resulting from gaming and the greatest amount of time spent gaming. This subtype scored very highly on several motivations including achievement, sensation-seeking, and role-playing. This subtype also scored highly on both self-esteem and escapism, which the researchers suggested might indicate that hardcore players tend to define themselves by their virtual life and online reputation (i.e., they do not perceive their real-world and online identities as being separate, like *Escapers*).

In line with Faulkner et al. (2015), Billieux et al. concluded that the diverse psychological profiles of IGD indicated that there was a need for personalized (i.e., person-centered) interventions that target specific psychological mechanisms and needs. Each problematic subtype requires a tailored care plan with specific treatment techniques that cater to their unique profile, e.g., cognitive control techniques to reduce impulsivity among *Achievers;* therapies to address underlying psychopathological problems for *Hardcore* players; and behavioral activation for *Escapers* to increase their engagement in real-world activities and develop an offline identity. Chapter 7 provides further discussion of some of these treatment strategies for IGD, and Chapter 5 describes some screening tools that may be used in conjunction with IGD criteria and scales to assist in identifying these subtypes.

A recent paper by Lee, Lee, and Choo (2017) proposed another typology of problematic gaming. This work was guided by Blaszczynski and Nower's (2002) pathways model of problem gambling adapted to the IGD research literature. These researchers proposed three main IGD subtypes, including: (1) the *impulsive/aggressive* gamer, (2) the *emotionally vulnerable* gamer, and (3) the *socially conditioned* gamer. Lee et al. explained that the first subtype (*impulsive/aggressive*) was typically a male adolescent who played games as a way of channeling their aggressive impulses. These gamers are highly impulsive and demonstrate poor executive control. Their mood will often fluctuate greatly during play, from excitement to intense anger and frustration

and anger. They tend to be boredom-prone and have a need for heightened sensation, and therefore, they tend to prefer multiplayer online battle arena (MOBA) games and first-person shooters, because these games are highly competitive and feature more violence than most other types of games. This subtype is likely to demonstrate attention-deficit issues and externalizing behaviors.

Lee et al.'s second subtype (*emotionally vulnerable*) played games primarily for escapism or mood-modification purposes. These players used games to remedy emotional distress and escape from stressful reality. They tended to be attracted to games that offered immersion, including character- and story-driven experiences, rather than intense action-based games. Females with IGD may be more likely to fall into this category. Emotionally vulnerable players tend to have low self-esteem, decreased satisfaction with daily life, and comorbid mood disorders. This subtype is generally more prone to internalizing problems (e.g., nervousness, somatic complaints, and social withdrawal) and will often report schematic beliefs with themes of worthlessness and unlovability.

The third subtype (*socially conditioned*) referred to problematic gamers that played for online socialization and social motives. These players tended to be quite lonely and less socially connected in the real world. Lee et al. posited that there were two types: (1) a *covert* type that tends to withdraw socially and may have social phobia, who is drawn to the "safety" of online games and (2) an *overt* type who is narcissistic and seeks social status in online games, such as leading an online guild. These two subtypes may play the same online games, but the *overt* type will tend to engage with more of the online features (e.g., clans, chat, group activities).

Applying profiles to person-centered treatment

Lee et al.'s (2017) framework has several features in common with Billieux et al.'s typology. Both groups of researchers suggested that IGD subtypes may be distinguished according to gaming motives, personality factors, and psychopathological symptoms, while recognizing the central mechanism of impulsivity across the subtypes of players. Similarly, Lee et al. advocated for a person-centered approach to treatment based on recognizing the needs of these subtypes. For example, the researchers suggested that *emotionally vulnerable* players may benefit from psychosocial interventions that improve their social living conditions and help to establish more healthy relationships in the real world. The *impulsive* gamer subtype may benefit from treatment, such as medication, to address underlying issues of attention impairments. Like Billieux et al., however, Lee et al. did not provide detailed treatment recommendations given the preliminary (but converging) evidence. Treatment strategies for IGD with practical examples are often described broadly in the literature, as research-practitioners are still trialing specific techniques for different populations of problem gamers.

Like others in the field, Lee et al. have recommended that further research is needed to validate IGD subtypes. There is also a need to identify how certain vulnerabilities may be best served in treatment. The field is young and lacks authoritative treatment recommendations that can inform the practical complexities (e.g., number and order of sessions) associated with IGD profiles. Clinical trials of IGD treatment tend to

apply a programmatic or "one size fits all" approach, for efficiency and ease of interpreting treatment effects. The recognition of IGD risk factors and profiles may inform not only the use of treatment techniques, but also how clinicians can engage clients in the whole process of treatment. Individuals with IGD can be quite difficult to engage in therapy and may not attend many sessions without the support of a partner or family. Therefore, one must determine the most optimal approach and develop a care plan tailored to the client and unique profile of risk factors.

The *overarching priority* is to establish a therapeutic alliance and maintain therapy engagement. It may not be feasible for clinicians to navigate more complex goals, such as the core psychopathology (e.g., modifying core beliefs) in the context of a brief intervention (e.g., three sessions) with a noncompliant client. Taking small and achievable steps will often be necessary. The clients' own goals for treatment will also have to be incorporated into the treatment plan in order to achieve compliance. Acknowledging the above IGD profiles, a clinician may note, for example, that an emotionally vulnerable player may not wish to quit playing social online games completely, but may want to achieve greater social competence in the real world. This goal could be explored through exposure therapy techniques for social phobia, which may in turn reduce the reliance on games to manage emotional distress.

Summary: The risk of the robots

In Isaac Asimov's (1964) science fiction short story, *Risk*, researchers are testing a new spaceship technology that is piloted by a robot artificial intelligence. When the ship fails to launch, one of the researchers suspects that the robot may have malfunctioned in some way. Upon investigation, they confirm that the robot pilot had applied too much force to the ship's controls, resulting in the failure and causing damage to the ship. However, they realize that another important contributing factor to this failure was human oversight in the verbal instructions given to the robot.

Asimov's story highlights the fact that there is often an important human element underlying the limitations of technology, and that one should not assume that the technology itself is always entirely to blame for negative consequences. In the same way, this chapter has attempted to show that, while gaming products may present some risks in relation to IGD, the players of these games are not passive but are themselves implicated in the harmful consequences of persistent gaming. Another observation of Asimov's story is that some of the researchers were quick to conclude that the robot had *not* been responsible for the malfunction, owing to its precisely structured mind and the successful mass adoption of robots in society. They had disregarded important factors in explaining the problem at hand. The study of IGD risk factors, including clinical work, should avoid this pitfall by considering all possibilities in developing a personalized framework of an individual's gaming-related problems.

This chapter showed that the major risk factors for IGD would appear to include being male, aged 12–25 years, with trait impulsivity and comorbid psychopathological conditions, low self-esteem, and having limited alternative interests. In addition, individuals from chaotic and insecure families, who have less structure in their daily

routine and have more access to games and more opportunities to play and who associate with peers who game at high levels, are at greater risk of IGD than others. Some game types, including MMO games and other competitive online games, also appear to be riskier than other games. Less research has focused on the characteristics of gamers who tend to play in moderation and play for positive reasons; however, some promising protective factors include being female and older (i.e., over 25 years), being more conscientious and extraverted, having high self-efficacy, and belonging to social circles that value a range of interests and responsibilities. There is some emerging evidence that certain risk factors may tend to cluster together into profiles, which vary according to IGD symptom severity, gaming preferences and motives, and comorbidity.

The identification of risk and protective factors for IGD has important implications for the design and delivery of interventions, including harm reduction strategies. For example, adolescents with poorer social skills who desire the comfort of less socially threatening online gaming environments may benefit from interventions that promote real-world social interactions, assertiveness training, and engaging in less time-consuming leisure activities that facilitate self-expression. Early adolescence is a particularly turbulent developmental period defined by yearning for identity and social conformity. Teenagers who are more socially isolated and/or confused by their place in their social world may be more at risk of pursuing the structure, predictability, and social status offered by online games—to the exclusion of healthy ways of meeting their needs. Programs that provide adolescents with skills and opportunities to integrate into the social institutions to which they feel they do not belong (e.g., school, employment, social clubs), and that foster the exploration and development of their identity in adaptive ways, are more likely to be effective in curbing the risk of IGD than the simple approach of restricting gaming.

The study of risk factors suggests that it is often more feasible to promote resilience in individuals than to remove all potential dangers from the environment. While the study of IGD has increasingly recognized that certain games or game features may be more "addictive" than others, such as MMO games, it may be more practical at this stage for preventative programs for problem gaming and IGD to focus on modifiable individual risk factors. This may include practical education about the game types with higher rates of IGD and the risky features in these games (King, Adair, Saunders, & Delfabbro, 2018; King, Herd, & Delfabbro, 2018). Gaming products appear unlikely to become less popular or less addictive, or to incorporate safety features to limit excessive playing, given the apparent limited or lack of interest from major gaming companies in implementing any meaningful social responsibility measures in gaming products.

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Cognitive features of IGD

4

Chapter Outline

Introduction and overview

Video games of all genres and designs require the player to make decisions. These decisions may be related to *strategy*, such as deciding on the most optimal move in order to win the game; or *story*, such as making a moral choice that affects the game's world and characters; or *aesthetic*s, such as choosing a paint scheme for a virtual racing vehicle. The cognitive psychology of video gaming is not a straightforward topic because there are often multiple demands on players' cognitive systems (e.g., memory, spatial reasoning, and problem-solving) and cognitive processes can vary significantly across games and gaming situations. Gaming is a complex interactive play activity that challenges the player to learn the conditions and outcomes governed by rules determined by its programming (Van Eck, 2010).

At its most basic level, a typical video game is an activity that tests the mettle of players in the context of a complex set of contingencies preprogrammed by the designers. Players are provided with feedback concerning their performance and progression in the game in the form of on-screen indicators of success or winning. Good players receive rewards, make progress, and "win," whereas bad players lose or make little

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progress in the game. Recognizing some of the ways that players must think in order to succeed, among the variety of cognitive demands in gaming, may be a useful first step toward understanding the broad appeal of the activity. Some of this analysis may include understanding how players become mentally "absorbed" in the act of gaming (Boyle, Connolly, & Hainey, 2011; Jennett et al., 2008).

However, this knowledge does not by itself pinpoint the important mental processes that explain why some individuals develop problems with gaming as well as the broader syndrome of behavior characterized by Internet gaming disorder (IGD). Indeed, conceptualizing the cognitive features of IGD has been a major challenge for the field because research in this area has progressed slowly because of ongoing questions about the legitimacy of IGD as a bona fide type of addiction. This chapter will attempt to address the question: How do individuals with IGD differ from other people in how they think about games, themselves, others, and the world?

This chapter will begin with a brief overview of the general cognitive explanations of addictive behavior with specific application to IGD. We will then discuss some of the recent literature on decision-making biases in IGD and their basis in explaining persistent gaming behavior. Some recent cognitive perspectives and models on gaming-specific beliefs and their associated empirical evidence will then be presented with examples.

IGD: The first criterion

The potential role of cognitive factors in IGD is implicit in currently proposed diagnostic criteria. The first DSM-5 criterion is a "preoccupation with gaming activities," which, in essence, refers to the state of constantly thinking about games. A similar concept is described in the Gaming disorder (GD) classification in the draft ICD-11, which refers to an increasing "prioritization" of gaming activities over life areas. These descriptions convey an image of the problematic gamer's mind as being strongly devoted to thoughts about gaming. Furthermore, the problematic gamer may be frequently distracted by gaming-related thoughts; have mental images or memories of games brought readily to conscious attention; and may avoid non-gaming-related thoughts whenever possible. Preoccupation is a feature of all addictive disorders, including gambling disorder, the behavioral addiction that is most similar to IGD.

While it is understood that problem gamblers are often preoccupied with thoughts of past wins and plans to obtain more money for gambling purposes, less is known about what individuals with IGD tend to think about specifically, how it relates to their gaming behavior, and whether their preoccupation tends to be associated with emotional distress. Similar issues have been raised in relation to the relevance of preoccupation to activities such as gambling, which also formally recognizes preoccupation as one of the criteria for gambling disorder in the current DSM-5 classification.

How does gaming differ from gambling?

It is common for parallels to be drawn between gambling and video gaming (Gainsbury, Hing, Delfabbro, Dewar, & King, 2015; Gainsbury, Hing, Delfabbro, & King, 2014;

King, Gainsbury, Delfabbro, Hing, & Abarbanel, 2015). Both are repetitive activities with intermittent reinforcement, decision-making opportunities, and elements of risk-taking (Delfabbro, King, Lambos, & Puglies, 2009). Gaming has even been referred to as a "nonfinancial form of gambling" (Griffiths, 1991, p. 54).

However, the financial element in gambling (i.e., risking and winning money) is integral to its legal definition, thus it may be somewhat of an oxymoron to say "nonfinancial gambling." What further confuses the matter is that some forms of gambling are referred to as "gaming" (e.g., casino games and gaming machines) because these activities offer probabilistic outcomes set by prescribed mathematical rules, such that one can determine the exact probability of certain outcomes or the long-term return to players in advance.

Gaming shares some of these elements, and some game types are becoming increasingly monetized (see Fields, 2014; Gainsbury, King, Russell, Hing, & Delfabbro, 2016), but video gaming, in contrast to these activities, is largely a *skill-based* activity where there is a clear relationship between player strategy or actions and outcomes (King, Delfabbro, & Griffiths, 2010). A first-person shooting game, for example, requires players to identify targets in their visual field and then rapidly execute in-game actions using practiced fine-motor skills. In contrast to most gambling games, each successive outcome of the game and a person's progress through the activity are much more deterministic, that is, determined by the player's choices and input.

Video game players tend to improve with practice and knowledge and do not participate in the activity on the assumption that there will be a *negative return* for the player (Delfabbro & King, 2015). Some video games have been developed that appear to challenge this convention, such as games that, for narrative reasons, might have the player's character die or the game save file may be deleted upon completion, but such examples are exceptional rather than typical cases. On the whole, it is entirely rational for a gamer to believe that, if he persists long enough and plays in the "correct" way, he will inevitably advance through the game and obtain an increasing number of wins or rewards. In video gaming, one will usually expect to be able to distinguish between experienced and skilled players who typically obtain good outcomes from those who are less experienced and receive poorer outcomes.

In contrast to gamers, gamblers are considered irrational if they decide to continue to gamble following significant losses, given the expected long-term financial return is not in their favor (Walker, 1992). Not all gamblers necessarily gamble in the expectation of winning, have long-term goals, or are always aware of the objective nature of gambling activities (Delfabbro, 2004). However, evidence from a variety of studies using the so-called "thinking aloud" method shows that gamblers often make statements indicative of a false understanding of gambling (Delfabbro & Winefield, 2000; Gaboury & Ladouceur, 1988; Griffiths, 1990, 1994). In relation to problem gambling, most of these beliefs relate to mistaken views about chance and probability. People will often fall victim to cognitive biases such as the *gambler's fallacy* or *representation heuristic* (Clotfelter & Cook, 1993); *availability heuristic* (Wagenaar, 1988); *biased attributions* (Gilovich, 1983); or an *illusion of control* (Dixon, 2000), which leads to unrealistic expectations about the ability to control or predict outcomes.

Despite these differences in the characteristics and the likely nature of cognitions, a number of similarities can also be noted. Both gaming and gambling involve a repetitive behavior undertaken to obtain intermittent rewards. Players make decisions, compete with an electronic device or other people, and time, money, and effort are invested to improve one's performance. These similarities were noted in a number of early studies of arcade video game machines (Fisher, 1994; Griffiths, 1991), in which parallels were drawn between the structural elements of the two activities and the ways in which people become cognitively involved. Early studies of problematic gaming employed a modified version of the DSM-IV-TR criteria for pathological gambling to identify clinical cases, based on the assumption that the activities (and therefore symptomatology) were identical (King, Haagsma, Delfabbro, Gradisar, & Griffiths, 2013).

More recently, similarities between gaming and gambling have been discussed in relation to the increasing blurring of definitions between these activities due to developments in mobile technology, online gaming, and social media (see Chapter 1). For example, it is now possible to gamble for points and credits on online versions of casino games, to play simulated gambling games within video games and to purchase credits to play simulated activities with uncertain outcomes (King et al., 2010). These activities remain difficult to classify because they are not commercially recognized forms of gambling because of the lack of monetary prizes, but may be subject to some similar forms of regulation in the future.

For the above reasons, it may be too simplistic to make a direct comparison between gaming and gambling in relation to some of the cognitions that underlie these behaviors. The primary way that video games resemble gambling is in regard to their *randomly determined* rewards. This may include an optional slot machine-style game for credits within a video game, which would also resemble gambling for its similar presentation. It has been more commonly observed that games provide a randomly determined reward as the "payout" for acts of skilled play or game completion, such as defeating a boss or finishing the level. In essence, the game play is largely skill-based, whereas the reward is random. Many gamers refer to this type of reward as Random Number Generated (RNG) "loot."

Gamers tend to understand that the game requires *skillful play*, but the payout is *chance-based*, unlike gamblers who tend to draw a connection between their actions and the outcome (i.e., illusion of control). This is supported by research that shows gamers tend to score significantly lower on measures of gambling-related bias than regular gamblers (King, Ejova, & Delfabbro, 2012). Some research has suggested, too, that experienced gamers tend to lack interest in gambling per se (Forrest, King, & Delfabbro, 2016) for reasons including the perceived lack of skill in gambling and the ability to create powerful identities within online groups in games. There is also much more emphasis on "team play" in online gaming, compared to gambling which typically involves individual efforts to "beat the house."

The element of randomness in video games may nevertheless have some influence on many gamers' motivations to play, even if not all gamers report cognitive biases related to chance outcomes. Younger gamers in particular may be more susceptible to certain gambling-related biases, such as the gambler's fallacy, in their experiences with RNG reward systems. They may believe, for example, that they are "closer" to

winning or "owed" a certain game item with successive attempts. Given that so-called pay-to-win RNG loot crates (i.e., in-game packages acquired with real money that offer the possibility to win random virtual rewards) are becoming more popular in online gaming, as game companies embrace the "microtransaction" model (see Chapter 1), more players may be inclined to make financial decisions in games based on chance-based phenomena.

The act of investing financially in virtual rewards is likely to strengthen the player's attachment to gaming activities and the intention to continue gaming. IGD in the DSM-5 states that "money is not at risk" (p. 797); however, some players may make large purchases of virtual items in games, which is an expense that cannot typically be refunded or recovered. The implication is that individuals with IGD who make these purchases may be resistant to reduce or stop gaming due to the belief that money would then be "wasted."

Is gaming a rational choice?

In the opening of this chapter, it was noted that gaming is an activity that requires the player to make certain choices. The concept of "choice" has been a critical one in addiction theory. Understanding how the individual makes choices related to playing games may go some way to explaining how gaming behaviors become problematic. From a certain point of view, individuals with IGD appear to "choose" to play games based on available information which may include an awareness of the adverse consequences of this choice.

Playing games excessively in the context of IGD may seem intentional because, for many people, the default model for explaining human behavior is based on the notion that we all make rational and informed choices. Accordingly, problematic gaming may be considered the product of a series of choices. The extreme version of this reasoning might conclude that there is no such thing as a "gaming disorder" or that there is not any abnormality in the mental functioning of the problematic gamer. The individual is simply deciding to play games having considered all other alternative actions. By this reasoning, a person with IGD living in squalor and isolation might be assumed to prefer to live this way and has control over his gaming. But does IGD reflect a lifestyle created by rational choices? Or does IGD entail unhelpful beliefs, faulty information-processing, cognitive distortions, and/or poor decision-making?

For a number of authors who have examined potentially "addictive" behaviors such as gaming, it is clear that they see the activity involving a form of "rational choice" (West, 2001). According to Becker and Murphy (1988), who presented an economic theory of rational addiction, addiction may be considered a purely economic behavior driven by stable rational preferences for certain addictive goods. "Rationality" refers to a consistent plan to maximize utility over time, where "utility" refers to quantifiable benefits or losses as viewed by the individual. This perspective seems consistent with the notion that the act of gaming itself requires the player to make plans and choices that have optimal outcomes or "utility." For example, players are often tasked with devising efficient ways of defeating an opponent or collecting resources to build a virtual

city. The view of a problematic gamer as a rational agent may, therefore, fit with an intuitive notion that gamers are rational decision-makers in games.

According to rational choice models, a problematic gamer is mostly a rational consumer who tends to look ahead and behaves in a way that maximizes preferences that they hold. Problematic gamers are "consumers" and playing games is "consuming a good." Gaming addiction involves an increase in consumption of goods as a result of past consumption. However, some of the assumptions and economic concepts of the model have major limitations in their application to problematic gaming.

In the context of gaming, consumption differs from other forms of consumption in that gamers (rather like gamblers) can undertake the activity repeatedly and may find that the nature of the gaming experience (e.g., due to upgrades and new content) may change over time. Outcomes may also be unpredictable or unexpected outcomes (e.g., winning or losing, to varying degrees), even though the person has devoted the same volume of resources to the activity (e.g., the amount of time spent). In this sense, gaming shares some similarities with gambling. Both activities involve devoting time or money to purchase a service or undertake an activity where outcomes may be subject to some unpredictability and where the quality of the outcome may not be the same each time.

Notwithstanding these similarities, many scholars feel that the concept of rationality is not entirely valid for understanding addiction. The main criticism of the rational choice model, and by extension the notion that problematic gaming is simply a choice made by the individual, is that it does not fit intuitively with the experiences of those working in the addiction field. Importantly, too, it does not fit with the affected players' experience of loss of control over gaming, or the painful regret about gaming behavior that led to personal harms or missed opportunities. As an adult gamer seeking help for IGD reported in one of our recent studies, "My life is falling apart. I can't go an entire day without playing a game. I have been trying very, very unsuccessfully to quit for a long time."

The rational choice model's concepts may also be difficult to present as a convincing explanation of problematic gaming for both the client and his family. At worse, it may reinforce an unhelpful view of the client as being at fault for choosing to have IGD or intentionally causing harm to self or others. Characterizing an adolescent with severe IGD who has become anxious and quit school, or totally disengaged from family and friends, as a "rational" person may alienate the clinician from those involved in the support of the adolescent.

Some of the language of rational choice models, however, may be convincing when used *judiciously* to explain the origins or early stages of an individual's gaming and its progression to problematic behavior. After all, many individuals prefer to think of their life as governed by free will or as having the freedom to make choices based on their needs and desires, or living according to personal values. Some clients may respond favorably to a formulation of their gaming behavior as a series of choices that are consistent with the high value they have attached to gaming activities. A skilled clinician may be able to use this information to develop a conceptualization of the client who has personal responsibility and agency, and thus the desire and capacity for change. This may include making comparisons between the personal qualities of the client

before they played games (e.g., independent, ambitious, curious) and the qualities of the client's online avatar (e.g., brave, strong, determined).

Exploration of the client's reasons for gaming and beliefs underlying the importance attached to gaming as compared to other activities may also lead to useful information about beliefs for case formulation (see Chapter 6). Such views are in keeping with similar arguments advanced in the gambling field (e.g., Blume, 1988) which argued that individual conceptualizations of disorders can serve important rhetorical functions. If people recognize that problematic outcomes are the result of internal/individual factors or perhaps the interaction between individual characteristics and the structural characteristics of activities, then this may motivate people to take personal action to alter their behavior.

The human-game interaction

Gaming is not a "mindless" activity, but one that involves making choices and engages an array of cognitive processes. One of the first books in psychology to address the topic of cognition in gaming and problematic gaming was written by Loftus and Loftus (1983). Their book provides a useful introduction to the basic cognitive systems involved in gaming, many of which inform our understanding of persistent and/or problematic gaming behavior.

Loftus and Loftus argued that gaming involves a complex mental system of interrelated components that combine to form the ability to develop player strategy. Individual differences in gaming ability and strategy occur according to differences in these underlying mental components. For example, players with greater visual attention capacity may be more adept at fast-paced action games (Boot, Blakely, & Simons, 2011). Gaming requires a large investment of cognitive resources via the activation of such components (Wouters, Van Nimwegen, Van Oostendorp, & Van Der Spek, 2013).

Problem gaming, therefore, presents a *mental burden* to players as the activity requires cognitive resources that would otherwise be expended on other activities. After all, if a person is concentrating intensely on gaming for 8–10 h per day, or the equivalent of a busy full-time job, then it follows that this person would be much less capable of managing other responsibilities that require attention at the same time.

Why do people become so immersed in games? For a start, gaming activities can involve *all five senses*. Visual information is constantly presented on-screen, such as colorful three-dimensional graphics and text. Auditory information, such as sound effects and music, is heard through the speakers or headphones. Tactile information may include the feel of the gaming controller, and its buttons and triggers. To a lesser extent, there may be olfactory and gustatory information associated with the food and drink (or other substances, such as caffeine, alcohol, or marijuana) that are consumed during the gaming session. Individuals with IGD often engage in long, uninterrupted sessions and, therefore, may need to eat and drink while playing. Gaming-related stimuli generate different sensations that are filtered by the player's attention.

Video games are designed to be as mentally stimulating as possible in order to give the player a continual stream of information. At the same time, games usually impose significant cognitive "task-loads" which demand significant attentional resources. Most games require complete focus. Many online games are also "persistent"; the player cannot pause the action. Not being able to look away from the screen, even for a moment, makes some games more challenging and immersive. Not surprisingly, some games have, in fact, been used to train certain cognitive abilities and attentional capabilities. For example, "action gaming" or games that rapidly present visual information and require fast hand-eye coordination have been shown to enhance visuospatial attention throughout the visual field (Green & Bavelier, 2006). Action games may also help to remediate dyslexia in children by improving attentional capabilities (Franceschini et al., 2013). More broadly, the design of some popular games was informed by prototypes or simulation tasks used in military training, pilot training, or other similar applications.

Gaming is an activity that motivates players to develop their capabilities to process sensory information to experience winning and success. They must also learn to disregard information that is nonessential to the player's goals. Some games have attentional requirements that exceed almost all other regular, everyday situations an individual may normally encounter—the player cannot look away for even a moment. The event durations in some games (e.g., short puzzle games like *Tetris*) may last under a minute, allowing the player to finish a game quickly and conveniently. However, many online games have modes (e.g., large social group activities such as "raids" in massively multiplayer online [MMO] games, like *World of Warcraft*) that may require three or more hours of sustained, uninterrupted play. Accordingly, individuals with IGD may refer to the attentional requirements of games as evidence of their ability to achieve a sense of control, focus, or mastery "against the odds."

Prolonged gaming behavior may support the belief, "*I am special for having played and completed this game*". It may also serve as confirmatory evidence that nothing else in life is quite as interesting, engaging, or exciting. In this way, gaming may be seen to have a special purpose or meaning. As a 35-year-old male with IGD reported to us, "*I lose all interest in real life and become so involved in the game because I am focused on the team objective, everything around me fades away*." The high attentional demands of gaming partly explain the lack of regard that an individual with IGD may have for other people, such as a partner or family members, and their living environment, leading to neglected basic domestic duties, including cleaning and tidying. For those with IGD, a focus on gaming for the achievement of rewards, belonging, or immersion is simply not compatible with attending to the real world.

Another interesting observation by Loftus and Loftus (1983) was the player's experience of "cognitive regret." The authors explained that, when a player fails or is unsuccessful in reaching a certain goal in a game, he may feel a sense of regret, along with other negative emotions, such as frustration, anger, or disappointment. However, in a "failure" situation (e.g., the player's character dies and must restart the level), the game usually provides clear feedback and/or has a predictable or deterministic structure that enables players to understand how success could have occurred. The variables that underlie success in games are not usually intended to be a mystery.

Most games tend to share the "winning strategy" within the first stage (i.e., the "tutorial") or, if the game is complex, more gradually over the course of the game. Armed with this understanding of how the game works, the player can often mentally construct an alternative world in which they had succeeded, and the failure event had not occurred. This alternative world is imagined with the necessary knowledge to achieve success, which then makes failure less frustrating and replaying an enticing option. Cognitive regret in games elicits internal statements of the form: "If only I had done A, then B (rather than C) would have been the result". In other words, "*I made a mistake, but I know how to fix it if I play differently.*"

Games are designed to provoke imagined possibilities within their imaginary framework. The more that the player's imagined actions involve personal or direct control (e.g., pressing a button more rapidly, or using a game item at the right time), the more likely it is that the losing scenario will be perceived as malleable or "fixable," and the more motivated the player will be to replay the game until the desired imagined outcome is reached. Replaying a game over and over may be necessary to eliminate the player's feeling of regret. It may be difficult or distressing for an individual with IGD to abandon a game while imagining alternative possibilities, the "what if" scenarios.

Loftus and Loftus argued that games provide the "ultimate chance to eliminate regret" (p. 33). Indeed, very few—if any—activities in life offer almost limitless opportunities to achieve a desired or "perfect" outcome with relatively little personal investment or risk. Failure in the real world can be permanent and irreversible. It is not difficult to see how the "ultimate chance" to achieve optimal outcomes in games becomes so appealing to individuals who feel powerless, believe that their decisions are inconsequential, or see the world as impenetrably complex, unpredictable, or unfairly challenging. Games represent order in the chaotic world of the user.

Gaming and decision-making biases

Decision-making has been studied extensively in the context of substance-related disorders as well as other mental disorders that involve perceptual disturbances, such as schizophrenia and, as noted above, in relation to gambling. In the last few years, significant advances in understanding of the core psychopathology of IGD have been achieved by attending to the processes, content, and structure of cognitions that influence gaming behaviors that produce harmful consequences (Caplan, 2010; Davis, 2001; Ko et al., 2017; Lee & LaRose, 2007; Morris & Voon, 2016). Several controlled studies have identified an array of decision-making biases in IGD that are similar to those found in gambling disorder and other addictions. A standard experimental paradigm in this area involves testing individuals with IGD or persons with suspected gaming-related problems on a range of cognitive tasks and comparing their performance to healthy controls (typically, people with limited gaming experience).

Studies to date have reported that problematic gaming is characterized by biases in how people interpret or process game-related information (Decker & Gay, 2011); impaired decision-making under risky conditions (Yao et al., 2015); a tendency to disregard objective probabilities (Wang et al., 2017); reduced feedback processing

(Yao et al., 2014); and a preference for immediate rewards over longer term gains (Pawlikowski & Brand, 2011). The presence of these biases is understood to make individuals much more vulnerable to developing an addictive disorder like IGD, as well as making their engagement in addictive activities generally more risky or harmful (Bailey, West, & Kuffel, 2013). For example, a bias toward immediate game rewards may increase the likelihood of an individual continuing to play games late at night rather than going to sleep to be ready for work in the morning.

Neurocognitive models propose that addicted individuals make inaccurate predictions of future outcomes and discount the future consequences of choices (Schiebener & Brand, 2017). Executive dysregulation and altered decision-making are often associated with higher reward salience (Volkow, Wang, Fowler, & Tomasi, 2012). Individuals with IGD may have difficulties in maintaining a stable mood and making sound decisions about gaming, which is combined with a strong desire or "wanting" of gaming rewards.

Controlled laboratory studies over the last decade have supported this proposition. For example, Decker and Gay (2011) conducted a study of 12 regular players of MMO games and 30 nonplayers. Participants' timing and accuracy of responses to common English and MMO-related words were assessed using a computer-based Go/No-Go task. The MMO players demonstrated faster reaction times and better discrimination of target words from distracters, but also showed higher response disinhibition. The results indicated that the MMO players demonstrated reduced impulse control, which was comparable with research findings on gambling and substance use disorders.

Other cognitive approaches

In addition to studies which have considered gaming from the perspective of the heuristics and biases approach, some work has examined whether gamblers differ in their appraisal of the benefits associated with gambling. Thus, while there are rational choice models of addiction that view problematic gaming as the product of informed choices about gaming, other models based on expectancy value theory indicate that even when choices are rationally made, it does not always mean that people make the most adaptive decisions. In these models, "expectancies" refer to the perceptions of the costs and benefits of an activity that contribute to excessive use.

Addictive behavior is considered the result of escalating expectations about the addictive substance or activity. Positive expectancies refer to the desirable expectations of use, such as feeling pleasure, reducing tension, having greater sociability, and greater cognitive functioning (Haagsma, Pieterse, Peters, & King, 2013). Negative expectancies refer to the expected adverse outcomes of not engaging in the behavior, such as experiencing withdrawal effects, being unable to cope with stress, and impaired functioning. As a 29-year-old gamer reported to us, "*I engage in gaming due to its challenging nature. I find it hard to keep my mind engaged during down time. My other pastimes are not as mentally challenging compared to the complexity of most of the games I choose to play.*" This line of thinking directs the individual toward gaming and develops an avoidance of other activities that might offer a challenge or mental stimulation.

In IGD, an example positive expectancy is "I will feel better if I play games" or "I need gaming to feel in control again". A negative expectancy would be "I cannot take this anymore, I need to play or I will not be able to cope." Expectancies are not simply beliefs, but form part of the memory structures that organize input to the brain and guide behavior. Expectancies are thought to regulate the individual's response to stressors and the extent to which they engage in the addictive behavior (i.e., level of consumption or activity).

Another set of beliefs that cooccur with expectancies are termed *facilitating beliefs* (Beck, 1993), which are cognitions that enable the individual to resolve ambivalence about whether to engage in or discontinue gaming. This can be observed in statements such as "I will only play games for an hour and then do my homework" or "It is already late, I should just keep playing now." Thus, although the person may appear to be making the choices which they feel will confer them the most benefit, such choices may not be the most adaptive long-term option and may also be influenced by other factors that reflect problems in various areas of social or psychological functioning. For example, a person who chooses short-term gains and sacrifices other commitments (e.g., work or study) with long-term consequences or who engages in gaming to avoid facing up to other problems is not engaging in an adaptive form of behavior.

In support of this view, evidence suggests that some gamers may have characteristics that make it hard for them to weigh up short-term benefits and long-term costs or to make decisions that indicate reflection or the balanced appraisal of the decision. For example, a study reported by Yao et al. (2015) assessed 34 individuals with IGD and 32 controls using a gaming-related Go/No-Go task. They found that IGD participants demonstrated significantly poorer inhibition to gaming cues as compared to the control group.

Another study by Pawlikowski and Brand (2011) assessed the decision-making competence of excessive *World of Warcraft* players. Their sample included 19 problematic gamers and 19 nongamers, whose performance on the Game of Dice Task under risky conditions was evaluated. The problematic gamers showed reduced decision-making ability and higher psychiatric symptomatology compared to the control group. They concluded that problematic gaming involves a "myopia for the future," meaning that affected individuals have a diminished awareness of the negative long-term negative consequences of gaming in social or work domains of life. This research has helped to inform interventions that aim to develop insight into "automatic" ways of thinking about games; employ practical strategies, such as reminders or alarms, to interrupt or limit gaming; and test the accuracy of beliefs about the consequences of continued gaming.

Introducing gaming-specific beliefs

In 2014, in a brief letter to *Addiction*, we queried whether typical screening items for "preoccupation" used in survey studies might be an "oversimplification" of the cognitive psychopathology of IGD (King & Delfabbro, 2016). We reasoned that many people who play games enthusiastically may be mistakenly inclined to report they are

"preoccupied" with gaming, by falsely equating their strong interest in games with a pathological obsession. Similarly, some "casual" (i.e., infrequent) players may report feeling "preoccupied", referring perhaps to a desire or future intention to play games. This point is highlighted in a study of 421 online gamers, where 22% of respondents played quite irregularly but still endorsed the IGD item for preoccupation (King, Delfabbro, & Griffiths, 2011).

Other researchers in the field have raised similar concerns about the sensitivity of this item. The problem was first identified and tested empirically by Charlton and Danforth (2007) who found that "highly engaged" gamers, including those who reported that gaming was their favorite hobby and who played every day, were likely to report that they felt "preoccupied" with games. This might include people who work in digital entertainment industries, such as game programming, games journalism, professional gaming (eSports), or entertainment (e.g., paid streaming). As a 24-year-old regular gamer stated in a recent study, "*I have been gaming for the last 16 years of my life, I think about games a lot purely because it is my passion and I am thankful to have it*". Charlton and Danforth suggested that preoccupation could be considered instead as a "peripheral" criterion of problematic gaming, or an indicator that carries much more weight in the presence of other criteria that measured harm resulting from gaming.

Some researchers have considered ways of improving the operational definition of preoccupation, particularly for screening purposes (Pontes & Griffiths, 2015). One suggestion has been to place greater emphasis on the actual *content* of thoughts about games, rather than the *frequency* of thoughts. In studies of other mental disorders with excessive behaviors, such as eating disorders, obsessive-compulsive disorders, and gambling disorder, useful advances have been made by attending to the "content" of problematic beliefs and assumptions associated with harmful behaviors.

For example, individuals with anorexia nervosa are known to report frequent thoughts about their body shape and/or appearance, as well as distorted thinking about body image and a pathological fear of gaining weight. Pathological gamblers report a tendency to think about and plan gambling sessions, in addition to holding irrational beliefs related to the long-term profitability and degree of player control involved in gambling. The concept of preoccupation by itself would not adequately describe the unique beliefs in these examples. Following this reasoning, it may be proposed that individuals with IGD possess an *idiosyncratic set of beliefs* that underlie and maintain excessive gaming.

A new framework for gaming-related beliefs

In a systematic review of 36 studies, we identified 24 cognitive processes implicated in problematic gaming (see Table 4.1. for a complete list) (King & Delfabbro, 2014a, 2014b). Grouping these cognitions into categories led to a preliminary framework of problematic gaming cognition with four interrelated components. These included: (a) overvaluing of online gaming rewards, (b) maladaptive and inflexible rules about gaming behavior, (c) overreliance on gaming to meet self-esteem needs, and (d) gaming as a method of gaining social acceptance.

Table 4.1 **Types of gaming-specific cognitions**

Cognition/schema	Illustrative client statement
Cognitive regret	When I make mistakes, lose progress, or fail in a game, I must reload and try again
Sunk cost bias	It would be a waste to stop gaming, when I have already invested so much time and energy
Overvalued reward	Rewards in video games are as important to me as anything else in my life
Overvalued avatar	When my game character achieves something, I feel like I have achieved that too
Mood expectancy	I tend to feel better after playing video games
Positive expectancy	Playing games has many other benefits in my life
Negative expectancy	I would feel bad if I was not able to play video games
Need for completion	When I have a goal or objective in a video game, I must complete it as soon as possible
Procrastination	I prioritize video games before doing something else, e.g., homework or chores
Rule-setting I	I tell myself "just a few more minutes" when I play a game, but then play much longer
Rule-setting II	I feel uncomfortable thinking about my unfinished goals or objectives in video games
Self-esteem	I am proud of my gaming achievements
Obsession	I find myself thinking about video games when I am not playing
Planning	I spend time planning or thinking about the next thing I need to do in a game
Perfectionism	I feel unsatisfied until I have done everything I want to in a video game
Black-and-white	No amount of gaming time ever feels like "long enough"
Social relatedness	People who do not play video games do not really understand an important part of who I am
Social rank	It is important to me that I am better at certain video games than other players
Acceptance	Other players admire and respect my gaming achievements
Control	I feel more in control when I play video games
Vulnerability	I would not be able to cope with stress in my life without video games
Safety	I feel safer and more comfortable playing a video game than in most other social situations
Achievement	If I complete an achievement, skill, or goal in a video game, I feel good about myself
Respect	When I succeed in a video game, players notice and respect me

The framework proposes that problematic gaming is associated with distorted perceptions of the value of gaming items, rewards, and/or virtual currency. To satisfy the need for valued rewards, the gamer develops inflexible rules about when gaming should occur and how long it should last. Goal completion or obtaining game rewards provides psychological fulfillment. This includes the mood-enhancing and relieving effects of moment-by-moment play, as well as satisfying needs for self-esteem and social status.

These cognitions have a circular relationship with behavior. Thoughts initiate and maintain gaming behavior, and gaming behavior strengthens the conviction of each belief, which in turn influences behavior. For example, the belief that "game rewards are as meaningful as anything else in life" leads to prioritizing gaming over other activities, and an increasing time commitment to gaming is justified by the belief that gaming must be an important activity.

Beliefs about game reward value and tangibility

Individuals with IGD may hold beliefs about the "special" nature of gaming rewards, activities, and identities. These thoughts about games are consistent with the central role of gaming in their life and the view of gaming as being of utmost importance. They "overvalue" gaming items, rewards, and/or virtual currency such that they are seen to be more valuable than other life activities, including school, employment, self-care, and/or interpersonal relationships. Indicators of these beliefs include making constant references to certain items in a video game, such as a rare reward, or referring in a reverent or worshipful way to gaming items and accomplishments.

Players with these beliefs may become quite upset by the loss of time or progress in a game (e.g., corrupted save file, banned player account), because they believe that their gaming progress and digital possessions have a special and irreplaceable value. A related belief is "avatar attachment," referring to a player's emotional connection to a game avatar or character that is viewed as equivalent to a friend, intimate partner, or an extension of oneself. Selnow (1984) observed a similar phenomenon in young arcade machine players that he termed "electronic friendship," to refer to the player's preference for games as surrogate companions because they were more exciting and easier to be around than people.

Maladaptive and inflexible rules about gaming behavior

Individuals with IGD tend to justify their decisions to continue engaging in Internet gaming despite knowledge of the adverse consequences. The optimal decision to avoid negative consequences of excessive gaming (e.g., missing work, failure to complete homework, neglect of household duties) would be to cease playing at a particular point in time. However, this often does not happen because the utility of the decision is not based solely on a weighing of the advantages and benefits of a particular course of behavior, but in relation to other behaviors that have already been undertaken or commitments that have already been made.

An example of this type of belief is the *sunk cost bias* (see Kahneman, 2011), or the justification of continued engagement in gaming based on the large investment of time and effort already committed to the game. While most players have "rules for gaming" that optimize strategy or performance, individuals with IGD tend to have rules that are much more inflexible (e.g., "I should always keep playing until I reach the next level") and therefore lead to harm.

Overreliance on gaming to meet self-esteem needs

Individuals with IGD tend to hold negative core beliefs about the self that are compensated for by expectations and experiences related to gaming. These beliefs will be examined in more detail in Chapter 6. Cognitions in this category include the use of Internet gaming as the primary means of feeling a personal sense of pride or competence. Another type of belief concerns the perception of control, including the notion that one has greater control or autonomy when playing games, which is often accompanied by thoughts that the real world is an uncertain or unpredictable place. An individual with IGD may believe that he can only feel safe in the online world, or that only gaming can provide a sense of mastery and personal accomplishment. This is reflected in the core belief, "I am nobody in the real world, but in games I am capable and in control."

Gaming as a method of gaining social acceptance

Individuals with IGD who tend to play online games, particularly those with a focus on competitive and cooperative play, may develop beliefs about these experiences in relation to social acceptance. They may place an increasing degree of importance on the social status and camaraderie within online gaming communities, while avoiding the undesirable aspects of social rules and responsibility in the real world. Players may report that their online relationships and/or rank or position within virtual social institutions (e.g., "guilds," "clans," or "raid parties") are more important than real world relationships (Zhong & Yao, 2012).

As social gaming activities require an increasingly greater time investment, there may be a corresponding perception of other life activities as peripheral, unsatisfying, and lacking in personal meaning. Indicators of these beliefs include the perception that only people who play video games, and even the same games, are capable of understanding the individual. A related belief relates to the protective social function of gaming, or the notion that gaming prevents the individual from being challenged and experiencing failure in life areas of responsibility. Individuals with IGD may lose interest or become bored with their game, but maintain their playing schedule due to the perceived social benefits of gaming activities.

Normalizing digital possessions

The current period of human history is often termed the "Information Age." This is meant to refer to the fact that society has experienced a shift from traditional industry

to an economy based on knowledge and information. This change was enabled, and is continually influenced, by new digital technologies, user devices, and networks that enable various means of communication. An area of growing interest in consumer psychology has been the ways in which people value their digital possessions. In 2008, Edward Castronova, an economist, asked the readers of his book, *Synthetic Worlds*, to consider at what point in the future a person might spend real money on a digital item for a virtual avatar (Castronova, 2008). This prospect was in fact a "risk-less prediction" (p. 265) because this event was already commonplace, particularly in South Korea.

Over the last decade, it has become increasingly normal for people to value their digital goods and spend money on them, not only making a "once off" purchase, but also continual financial expenditure toward adding to, updating, or preserving digital collections. The implication is that placing personal value on gaming or other virtual assets should not be considered an inherently misplaced notion. People value virtual objects for many of the same reasons as physical objects. Therefore, the phenomenon of "overvaluing" that is described in the previous section refers to the act of attributing "too much" value to gaming possession rather than the act of assigning value of any kind to gaming activities.

The normality of digital possessions has been highlighted by recent consumer research by Molesworth and Watkins (2016), who conducted a series of interviews with adult video gamers. Many of their interviewees had an extensive history of gaming and reported that it was their primary means of relaxation and socialization. Interviewees acquired gaming consoles and software in search of quick and easy episodes of achievement and progress. Gaming was not viewed purely as a leisure pursuit, but rather as a commodity that enabled players to accumulate a range of personal experiences and virtual goods.

The interviewees had collections of hundreds of games that they regarded as "special" because they provided a sense of completeness as a record of personal, technological, and economic progress. Collecting and completing games was a conscious process of acquiring "sacred" items or doing "something worthwhile." Gaming items and achievements may, therefore, be a source of personal pride for some gamers with IGD; as stated by a 22-year-old male player that we surveyed, "*I was proud when I finally reached level 99 in Runescape, it was a childhood dream*." The immateriality of digital possessions does not diminish the sense of attachment to them. Virtual is often *real enough.*

Games store memories

Game systems typically store records of the players' activities and progress (i.e., save files). Accordingly, players may develop a "transactive relationship" with games (see Wegner, Erber, & Raymond, 1991), in the sense that the game stores a "memory" of the individual that played it. By playing, the player becomes *a part of the game*. The player does not need to remember their gaming collections (e.g., inventory or accomplishments), because this is stored securely in the gaming device, like photos in an

album. This may include records of other players who have played with the individual. While gaming culture and consumer research highlight some of the common ways in which individuals "make meaning" out of gaming activities (i.e., how players construe or make sense of the importance of games), this line of research also has some practical implications for clinical work with individuals with IGD.

For example, it may be possible for clinicians to explore some of the personal meaning attached to gaming memories—what made each game "special." This may help to understand the compensatory function of gaming (e.g., how the player used games to overcome feelings of dissatisfaction in other life areas, or to gain a sense of competence and control). Many games keep a record of what the player did, and what the player thought was important to do, in the game. A player who explored the entirety (100%) of a virtual world may have a need for "completion." A clinician may refer to this record to inquire about the most significant game or gaming experience for the individual, to understand more about the early development and progression of the gaming disorder. Another implication is that the client may feel he has "disconnected" from a part of himself—a part stored away in the game device—when no longer playing the game.

Metacognitions in IGD

Problematic gaming may involve an awareness or understanding of one's own thought processes in connection to gaming behavior. As an adult gamer attempting to quit gaming told us, "*I realised I was so addicted to games because I was thinking about them all the time, about how much of a crutch or escape it is to me.*" Metacognitions in gaming have received much less attention, but have been recently articulated by Marino and Spada (2017), who proposed that individuals with IGD may hold certain beliefs about gaming related to *mental control*.

According to the model, positive metacognitions referred to thoughts about the usefulness of gaming as a self-regulatory activity. Such thoughts may include "Gaming helps me to control my thoughts" and "Thinking and planning my gaming helps me to play better." Negative metacognitions referred to the uncontrollability of thinking and behaviors related to gaming. Examples of these thoughts include "Thinking about gaming makes me lose control" and "I am unable to stop thinking about games once I start." Marino and Spada suggested that the content of dysfunctional cognitions may vary considerably from person to person, but the process that people use to respond to cognitions is usually constant. Therefore, metacognitive therapy can be advantageous because its application may be more standardized than cognitive-behavioral therapy for different formulations of IGD.

Shifting gaming-related beliefs with abstinence

Describing the nature of cognitive features in IGD is a useful first step for clinicians. It is usually necessary to understand the parameters of the phenomenon one is seeking

to change. The next pertinent issue is the modification of these beliefs about games. Chapter 7 will present a more detailed summary of treatment strategies for IGD; in this section, we will present some preliminary research on cognitive changes resulting from initial behavioral change.

Cognitive theories suggest that gaming-related problems are maintained by preoccupation with online gaming activities and a set of maintaining beliefs that gaming can be relied upon to fulfill certain psychological needs, such as achievement, social belonging, and self-esteem. These cognitive processes are developed, strengthened, and maintained by persistent gaming behaviors. A corollary argument is that reducing gaming activity, even temporarily, may weaken some of the cognitions that underlie problematic gaming. In other words, gaming less may result in thinking less about gaming.

A brief period of gaming abstinence may function as a simplified behavioral experiment that might challenge expectancy beliefs about gaming (e.g., "*I will not be able to cope without playing an online game*" or "*I will only feel better if I play a video game*"). Additionally, the act of foregoing gaming, an activity that may typically involve 8–10 h per day, may facilitate exposure to situations that the individual had been avoiding (e.g., going outside, taking public transport, shopping, going to school, or visiting real life friends). Given the high attentional demands of gaming, abstinence from games may reallocate cognitive resources for gaming to other non-gaming tasks. Resources for critical evaluation of the functional consequences of persistent gaming (i.e., develop insight into harm) may also become available.

Some small-scale studies have attempted to examine the psychological effects of temporary gaming restriction among adolescents who engage in a lot of gaming (King, Kaptsis, Delfabbro, & Gradisar, 2017). One of the challenges for studies of this kind has been identifying effective ways of restricting gaming (or other electronic media) in controlled studies, given the widespread availability of gaming and the integration of electronic devices into many areas of daily life (e.g., school, home, social domains). The most reliable approach to achieve abstinence has been to temporarily remove the adolescent from their home environment. Some nations, such as China, have employed some extreme versions of this approach, including "boot camps" or military-style facilities where adolescents are forced to live away from their parents to overcome their addiction to games.

More conservative approaches have been examined empirically. A study by Sakuma et al. (2017) investigated the outcomes of a therapeutic residential camp for adolescent problem gamers who were unable to play games for 9 days. They reported that the camp improved adolescents' recognition of gaming problems and increased their self-efficacy. However, despite these cognitive changes, it was noted that after the camp the participants "were still gaming almost daily" (p. 359), albeit to a lesser extent—about 3 h less per day.

Another study by Uhls et al. (2014) investigated the effect of 5 days spent at an overnight nature camp for adolescents where television, computers, and mobile phones were not allowed. The researchers reported that digital media restriction significantly improved recognition of nonverbal emotion cues including facial expressions and videotaped scenes of social interaction. These studies highlight the utility of

behavior change in challenging gaming cognitions, building insight, and developing other cognitive abilities.

Gaming abstinence may also influence problematic thoughts about games in adults. We have investigated the effectiveness of a voluntary 84-h abstinence protocol for modifying problematic gaming cognitions and behaviors (King et al., 2017). A sample of 24 adults were recruited from online gaming communities, including 9 individuals who screened positively for IGD. All participants agreed to abstain from gaming from Friday night to Monday midday. Surveys were administered at baseline, and then at daily intervals during abstinence, and at follow-up periods of 7 days and 1 month. A 24-item survey measure of gaming cognition (the *Internet Gaming Cognition Scale* [IGCS], which has items comparable to those listed in Table 4.1) was administered each time. Brief voluntary abstinence was found to be successful in reducing hours of gaming, maladaptive gaming cognitions, and IGD symptoms.

Abstinence is not for everyone. While it was difficult to recruit willing participants and the response rate to online invitations was quite low (i.e., <1%), the abstinence protocol itself was highly acceptable to participants with total compliance and no attrition. There was clinically significant improvement in IGD symptoms in 75% of the IGD group at 28-day follow-up (i.e., 75% of individuals with IGD met fewer than five IGD criteria at the end of the study). There was also improvement in maladaptive gaming cognitions in 63% of the IGD group, whose mean IGCS scores had reduced by 50% and were comparable to the non-IGD group at 28-day follow-up. Fig. 4.1 presents a visual representation of the significant decrease in gaming cognitions resulting from abstinence.

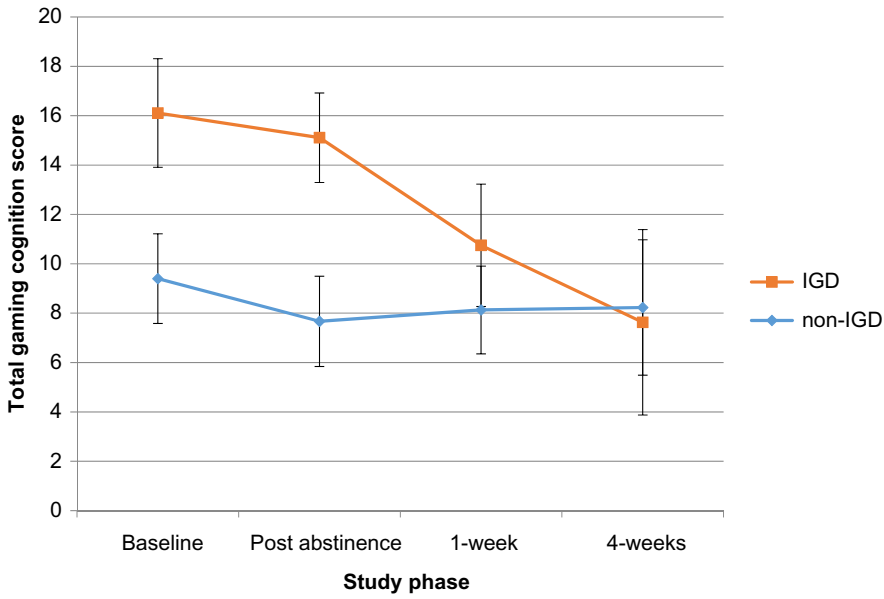

Fig. 4.1 Reductions in gaming-related beliefs following gaming abstinence.

There are several explanations as to why abstinence might weaken gaming-related cognitions. Restricting gaming may provide individuals with a practical demonstration of their ability to cope without gaming, or the necessary motivation to pursue neglected hobbies, responsibilities, or relationships. Another possibility is that complex gaming stimuli, such as challenging, time-limited, or multistaged goals that require social cooperation, become preoccupying for players given the requirement of planning and strategy for goal completion. The regular act of abstaining (i.e., total restriction of gaming stimuli), even temporarily, may reduce preoccupation about goals and thus diminish the player's sense of investment in game progress, achievements, and future events in the game.

Although the above studies are somewhat limited by small samples, they demonstrate that brief abstinence may be a simple, practical, and cost-effective means of modifying unhelpful gaming cognitions, assuming the willing cooperation of those involved. It may, however, be only a short-term measure or a technique that enables entry to exploring the client's deeper issues and vulnerabilities related to gaming.

Summary: Thinking, fast and skilled

The cognitive psychology of IGD is a relatively new topic within the developing field of behavioral addictions. Many of the models and studies described in this chapter are quite new and have yet to be replicated or verified by empirical studies. Knowledge in this area is likely to be updated as researchers investigate IGD from the perspective that it is a disorder with some distinctive features rather than a carbon copy of gambling or substance use-related disorders. This chapter has shown that gaming and gambling activities share some common playing elements, but there are important differences in the ways gamers and gamblers think while in the state of play. Clinicians with backgrounds in problem gambling have a great deal of useful knowledge to apply to cases of IGD, but they should be mindful that some of the cognitive biases related to chance-determined outcomes may *not* apply to gaming.

Gaming is a predominantly skill-based activity that enables individuals to compensate for the lack of purpose, control, and achievement in their real world life. A major cognitive feature of IGD is a distorted view of the value of gaming pursuits, items, and identities. Individuals with IGD have been shown to have an array of decision-making biases that fundamentally impair their ability to make reasonable judgments about gaming activities. It is imperative for the field to continue to investigate these proposed features of IGD because clearer descriptions of these cognitions will improve screening and provide useful targets for "gold standard" psychological treatments such as cognitive-behavioral therapy.

Individuals with IGD appear to hold distinct beliefs about themselves, others, and the world. A fundamental cognitive feature of the disorder is "preoccupation," or the experience of constantly thinking about gaming activities and the anticipation of future gaming sessions. As a clinical concept, the term "preoccupation" connotes a state or condition of mental absorption or engrossment in something. Some scholars have debated the usefulness of this concept and expressed some

reservations about the way it is typically measured (e.g., "*Do you find yourself thinking about games a lot of the time?*").

Screening questions for preoccupation may fail to capture dysfunctional thinking because many normal or healthy gamers who are passionate about gaming will report spending a lot of time thinking about them. It is, therefore, important to consider preoccupation as the act of constant thinking about games in ways that are intrusive, unwanted, distracting, or interfering for the individual. Screening for signs of preoccupation in ways that reflect these characteristics (as opposed to normal phenomena like "daydreaming" about gaming) may help to reduce the likelihood of "false positives" in population studies of gamers, such as those which have reported IGD prevalence rates exceeding 10%.

IGD is characterized by persistent gaming that has negative consequences (Billieux et al., 2017; Saunders et al., 2017). It is a disorder maintained by nonoptimal gaming-related decisions and inflexible rules for gaming behavior that ultimately bring harm to the individual. This chapter has attempted to show that gaming is a complex, goal-oriented activity that tends to demand the full attention and practiced skill of the player to achieve a positive return (i.e., "winning"). Insights from studies of the cognitive demands of gaming indicate that gaming involves a system of interrelated mental processes. This helps to explain why it may be difficult for individuals to do much else while engaged in a game, and how gaming can be more displacing than other addictive activities like cigarette smoking or drinking alcohol. However, it is necessary to clarify that the mentally absorbing nature of gaming is not inherently pathological and does not by itself explain why some individuals develop a pattern of problematic gaming behavior that may become IGD. This is just one piece of the puzzle.

All regular gamers regard games as stimulating in some way or another, just as people find books, films, and good conversation to be engaging. The critical point is that the structural design and cognitive requirements of games can serve to develop and reinforce certain unhelpful beliefs in individuals who are vulnerable to addiction. Such beliefs about games have a compensatory function related to the individual's perceived deficiencies in areas of control, mastery, and/or self-esteem. In short, individuals with IGD perceive gaming not only as fun and engaging, but as the solution to many of their underlying problems.

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Screening and assessment of IGD

5

Chapter Outline

Introduction and overview

The beginning and most crucial step of interaction between client and practitioner is a thorough assessment. In the Australian mental health system, as in many systems

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around the world, the client is often taken through a number of different screenings and assessments on the treatment pathway. Psychological assessment aims to increase understanding of the disorder to enhance the client's motivation to engage and remain in treatment. Given that gaming is such a popular activity worldwide, practitioners are likely to encounter many clients with presenting problems where gaming is implicated *to some extent* (Mitchell & Wells, 2007).

Gaming behaviors may not always be of clinical relevance. This includes cases of adolescents referred by parents with the assertion that the adolescent has diminished control over their gaming behavior. Thus, this chapter begins with a cautionary note: always be wary of referrals for psychological problems that are purportedly related to gaming. Abductive reasoning about pathology can be misleading when applied to common or everyday behavior. What looks like a gaming problem may not always be a gaming problem.

IGD is a provisionally classified disorder in both the DSM and ICD systems (Saunders et al., 2017). Hence, for medico-legal purposes in many regions around the world, a person cannot technically be "diagnosed" with IGD. Among the most vocal critics of gaming disorder, IGD is considered a kind of phantom or "castle in the air": a false disorder that exists only in the minds of those who irresponsibly lend support to a set of inadequate criteria wrapped in a constraining conceptual model (Starcevic, 2017; Van Rooij & Kardefelt-Winther, 2017). Regardless of whether IGD ever becomes legitimized as a proper disorder in the DSM, it is necessary for clinicians to describe and make sense of clients presenting with mental health issues directly related to persistent gaming. This practical need cannot be avoided or resolved by objections to gaming as a disorder on conceptual or value-based grounds.

The position of this chapter is aligned with the view of many in the field, that is: (1) clinically significant problems associated with gaming *do* exist and (2) such problems tend to have features in common with other addictive disorders, including gambling. The DSM-5 conceptualization may not be perfect or final in its wording, but it fulfills an important need for consensus development and stimulating further research in various areas. Further work is needed, for example, to define whether some symptoms (e.g., tolerance and withdrawal) are coherent and commonly occurring (Billieux, Deleuze, Griffiths, & Kuss, 2015; Billieux, Schimmenti, Khazaal, Maurage, & Heeren, 2015; King, Herd, & Delfabbro, 2018; Saunders et al., 2017). While there is still a possibility that the current conceptualization of IGD as a behavioral addiction could be replaced with an alternative model, minor updates and refinements to the IGD category (e.g., wording of symptoms) seem more likely for the foreseeable future. Presently, therefore, the most practical approach is to employ screening and assessment methodologies for IGD that are consistent with its most widely accepted criteria.

This chapter is divided into two main sections that will describe assessment and screening approaches to IGD. We will begin by discussing assessment issues pertinent to IGD and its related factors, including basic content areas with example questions, and then will discuss available tools for screening for IGD and their utility for clinical assessment.

Avoiding "overpathologizing"

Some scholars have expressed concern that some cases of *normal gaming* might be confused with gaming disorder (Colder Carras et al., 2018; Ferguson & Colwell, 2017). A recent debate paper by Aarseth et al. (2016), for example, has argued that making gaming disorder a legitimate diagnosis (in specific reference to "Gaming disorder" [GD] in the ICD-11) would substantially increase the risk that some individuals would be incorrectly diagnosed with GD. Aarseth et al. argued that the recognition of a disorder makes it more likely that people will be diagnosed with that disorder.

While it is true that a diagnostic category in a classification system is first necessary to make the diagnosis possible, it seems just as logical to conclude that having clear diagnostic criteria and practice guidelines will *reduce* the likelihood of "false positives." While good clinicians will occasionally make errors, they do not tend to impose disorders on cases that do not fulfill the criteria (Saunders et al., 2017). It is unlikely, then, that an individual who enjoys gaming and plays in moderation, or has another mental disorder, would be classified as having IGD. Individuals with IGD are defined by their inability to regulate their gaming behavior, which makes them qualitatively different from normal players.

Functional impairment resulting from gaming is a core criterion of gaming disorder. The descriptions of IGD and GD refer to the presence of a gaming behavior pattern that results in functional impairment, as a requirement for meeting the criteria of the disorder. For example, IGD in the DSM-5 refers to neglect of other activities or responsibilities due to gaming four times in its description. Clinicians can, thus, avoid "overpathologizing" individuals by ensuring that their assessment has fulfilled this basic requirement: impairment due to gaming. Similarly, research studies on problematic gaming may be much less likely to misclassify normal gamers as problematic gamers if functional impairment is a requisite screening item (i.e., it is prioritized ahead of all other criteria, such as preoccupation or withdrawal).

Functional impairment in the context of "*Disorders due to addictive behaviors*" is referred to in the ICD-11 draft as "distress or interference with personal functions" that are "of sufficient severity to result in significant impairment in personal, family, social, educational, occupational, or other important areas of functioning" (World Health Organization, 2017).

Early screening inconsistencies

IGD was first proposed under a different name. On May 1, 2012, the DSM-5 Task Force and Work Groups proposed that "Internet Use Disorder" (IUD) should be included in Section III of the DSM-5 as a condition for further empirical inquiry. This announcement marked the first occasion of a disorder involving repetitive online behavior being put forward for consideration in clinical nomenclature. The proposed IUD classification contained nine criteria, which included seven criteria that specifically refer to

"Internet gaming" and two other criteria that refer to "Internet use" more generally. The inconsistency between the IUD name and its primarily gaming-related criteria may have stemmed from some initial uncertainty regarding the weight of evidence in support of documented harms to individuals resulting from different Internet-related behaviors. Presumably, it was deemed necessary to limit the potential for any and all online behaviors and applications (e.g., online social networking, online shopping, web browsing, etc.) being included by the proposed IUD category.

The next iteration (IGD), which appears in Section III of the DSM-5, referred to gaming behavior only (including both online/offline types). However, some scholars believe that other specific Internet-related disorders may eventually follow as more evidence is gathered. Online social networking-related disorder (e.g., related to *Facebook*, *Twitter*, etc.) and online pornography use disorder seem to be the next likely candidates for consideration.

Screening approaches to problematic gaming were inconsistent prior to the DSM-5 (Sim, Gentile, Bricolo, Serpollini, & Gulamoydeen, 2012). For example, we conducted a systematic review that was published in the same year as the DSM-5 (i.e., King, Haagsma, Delfabbro, Gradisar, & Griffiths, 2013) that reported that, across 18 assessment tools employed in 63 studies, no two measures of problematic gaming were alike in their conceptualization and ability to "map out" diagnostic features. Table 5.1 presents a summary of these tools, highlighting the inconsistency of symptom

Table 5.1 Inconsistent symptom coverage by psychometric instruments prior to the DSM-5

Instrument	Cognitive salience	Loss of control	Withdrawal	Tolerance	Escape	Euphoria	Relapse	Dependency on others	Deception	Conflict: Work/School	Conflict: Household	Conflict: Sleep	Conflict: Relationships	Conflict: Financial	Conflict: Illegal acts	Using despite harm
Internet Gaming Disorder in the DSM-5	●	●	●	●	○	○	○	○	●	●	○	○	●	○	○	●
Adapted DSM-IV-TR for Pathological Gambling	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	○
Adapted DSM-IV-TR for Substance Dependence	○	●	●	●	○	○	●	○	○	●	○	○	●	○	○	●
Addiction-Engagement Questionnaire	●	○	●	●	○	●	●	○	○	●	○	●	●	○	○	○
Compulsive Internet Use Scale (CIUS)	●	●	●	○	●	○	●	○	○	●	○	●	●	○	○	○
Engagement-Addiction Questionnaire	●	○	●	●	●	●	●	○	○	●	○	●	●	●	○	○
Exercise Addiction Inventory (adapted)	●	○	●	●	○	●	●	○	○	○	○	○	●	○	○	○
Game Addiction Scale (GAS)	●	●	●	●	●	●	●	○	●	●	○	●	●	○	○	○
Korean Internet Addiction Test (KIAS)	●	○	●	●	○	○	○	○	○	○	○	●	●	○	●	○
Online Game Addiction Scale - Adolescents in Taiwan (OAST)	○	●	●	●	○	○	○	○	○	●	○	○	●	●	○	○
Online Game Addiction Index (OGAI)	○	●	●	●	○	○	○	○	○	○	●	●	●	○	○	○
Problem Videogame Playing (PVP) Scale	●	●	●	●	●	○	○	○	●	●	○	○	●	○	○	●
Problematic Internet Use Scale (ISS-20)	○	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○
Problematic Online Game Use Scale (POGU)	●	●	○	●	○	●	●	○	○	●	○	○	●	○	○	○
Problematic Online Gaming Questionnaire (POGQ)	●	●	●	○	●	●	●	○	○	●	●	○	●	○	○	○
Video Game Addiction Test (VAT)	●	●	●	○	●	●	●	○	○	●	○	●	●	○	○	○
Video Game Dependency Scale (KFN-CSAS-II)	●	●	●	●	○	○	○	○	○	●	○	○	●	○	○	○
Young Internet Addiction Scale (YIAS)	●	●	●	●	●	●	○	○	●	●	○	○	●	○	○	○
Young Internet Addiction Test (YIAT)	●	●	●	○	●	●	●	○	●	●	●	●	●	○	○	○

Note: ● assessed; ○ not assessed.

Note assessed; not assessed.

coverage in measures of problematic gaming as a disorder. Interpersonal conflict due to gaming was the only indicator of problematic gaming that was included across all 18 tools. This indicator does assume, however, that the individual lives with or has a partner, friends, or family to experience the social concern and surveillance required for this criterion (Lemmens et al., 2015).

While some scholars have voiced objections to the proposed IGD classification, others claim it has facilitated a more unified approach to screening (Griffiths, King, & Demetrovics, 2014; Griffiths et al., 2016; Petry et al., 2014). This unity has arguably given way to some "cloning" of the criteria by researchers to develop "new" versions of IGD scales that are only marginally different to each other. Billieux, Deleuze, et al. (2015) and Billieux, Schimmenti, et al. (2015) argued that confirmatory approaches that are too reliant on IGD scales may overlook other important aspects of problematic gaming behavior.

As a sidenote, some researchers have treated the IGD classification as a "carte blanche" to consider any activity is addictive and thus have substituted the word "gaming" in IGD for any other behavior. The addictions field is increasingly tasked with responding to new proposals for disorders of questionable validity cut from the IGD cloth (Billieux, Deleuze, et al., 2015; Billieux, Schimmenti, et al., 2015).

Internet gaming disorder—DSM-5 IGD criteria revisited

As noted throughout this book, IGD is not yet a fully accepted diagnosis. Nevertheless, the DSM-5 criteria can still guide the conceptualization of problematic gaming behavior. The proposed definition of IGD in the DSM-5 is "persistent and recurrent use of the Internet to engage in games, often with other players, leading to clinically significant impairment or distress" (APA, 2013; p. 795). IGD includes offline types of gaming. IGD is indicated by meeting five (or more) of the following criteria in a 12-month period:

1. *Preoccupation*. Thinking about previous gaming activity or anticipation of playing the next game; Internet gaming becomes the dominant activity in daily life.
2. *Withdrawal.* Symptoms typically including irritability, anxiety, or sadness when Internet gaming is taken away, but there are no physical signs of pharmacological withdrawal.
3. *Tolerance*. The need to spend increasing amounts of time engaged in Internet games.
4. *Loss of control.* Unsuccessful attempts to control the participation in Internet games.
5. *Loss of non-gaming interests.* Loss of interest in previous hobbies and entertainment as a result of, and with the exception of, Internet games.
6. *Gaming despite harms.* Continued excessive use of Internet games despite knowledge of psychosocial problems.
7. *Deception of others about gaming.* Deception of family members, therapists, or others regarding the amount of Internet gaming.
8. *Gaming for escape or mood relief.* Use of Internet games to escape or relieve a negative mood (e.g., feelings of helplessness, guilt, anxiety).
9. *Conflict/interference due to gaming.* Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of participation in Internet games.

Gaming disorder—Beta draft ICD-11 description

To quote from the beta draft ICD-11, Gaming disorder (GD) "predominantly online" is manifested by a persistent or recurrent gaming behavior (i.e., "digital gaming" or "video gaming") that is primarily conducted over the internet and is characterized by an impaired control over online gaming, increasing priority given to online gaming over other activities to the extent that online gaming takes precedence over other interests, and daily activities and continuation of online gaming despite the occurrence of negative consequences.

The behavior pattern is of sufficient severity to result in significant impairment in personal, family, social, educational, occupational, or other important areas of functioning (Saunders et al., 2017). These features and the underlying pattern of online gaming are normally evident over a period of at least 12 months in order for a diagnosis to be assigned, although the required duration may be shortened if all diagnostic requirements are met and symptoms are severe. Gaming disorder may also occur as a "predominantly offline" subtype.

Hazardous gaming—Beta draft ICD-11 description

The beta draft ICD-11 includes a less severe, nondisorder category of problematic gaming termed "Hazardous gaming" that refers to gaming that affects general health. To quote the ICD-11, Hazardous gaming refers to a pattern of gaming, either online or offline that appreciably increases the risk of harmful physical or mental health consequences to the individual or to others around this individual. The increased risk may be from the frequency of gaming, from the amount of time spent on these activities, from the neglect of other activities and priorities, from risky behaviors associated with gaming or its context, from the adverse consequences of gaming, or from the combination of these. The pattern of gaming often persists in spite of awareness of increased risk of harm to the individual or to others.

Assessment of gaming pattern and associated problems

Assessment is not simply an information-gathering exercise, it is also a part of the therapeutic process in which the clinician helps the client with IGD to begin to understand the links between gaming behaviors and resultant harms. Addiction therapists often refer to the "fog of addiction," or the notion that addicts tend to lack the capacity to see the nature of their addiction while they are experiencing it. Assessment aims to help the client see through this "fog" to identify the opportunity costs and impacts of gaming. A nonjudgmental approach is essential because the client may believe that the clinician has no interest in gaming or has an "anti-gaming" stance, which may be consistent with their experiences in their close relationships, such as with a partner or parents. The aim of the first assessment session is to examine in detail the client's gaming behavior and associated lifestyle problems.

The following sections will discuss relevant components of assessment of gaming behavior that are intended to complement the standard semi-structured clinical interview approach. Clinicians differ in their preambles and approaches to assessment for reasons including personal preference and workplace necessity, such as the clinician's training or therapeutic orientation, treatment setting, mandatory reporting requirements, referral source, available background information or previous assessments, client status (i.e., age, willingness to enter treatment), and presenting parties (e.g., client alone, client with partner, or client with family).

The following IGD-related question content areas are presented to guide the collection of basic but crucial information for case formulation, but are intended to be flexibly adapted rather than prescriptive. These questions may supplement other standard approaches to clinical assessment (e.g., the Mini-International Neuropsychiatric Interview [M.I.N.I.]).

Frequency of gaming behavior

How often does gaming occur and how much time does the client usually spend gaming? A simple method to assess the frequency of gaming behavior involves presenting the client with a weekly schedule (i.e., Monday to Sunday) and asking the client to record the number of hours spent gaming on each day in a typical week in the last 3 months. The clinician may then query whether this level of use applies to a longer time frame, such as 6 or 12 months. This weekly schedule can usually be completed in session within a few minutes. Fig. 5.1 presents an example that may be suitable for clients of all ages.

A more sophisticated approach involves a detailed schedule that includes the time of day and asks the client to include other activities such as sleep and meals, as well as responsibilities such as school or employment. This approach may be more suitable

	Never	Days per week (write # of hours in each box)						
		Mon	Tue	Wed	Thu	Fri	Sat	Sun
Console games (e.g., Xbox, Playstation, etc.)								
PC games								
Hand-held games (e.g., PSP. Gameboy, etc.)								
Mobile phone games								
Arcade games								

Fig. 5.1 Example of weekly schedule to assess frequency of gaming behavior.

as a diary homework exercise between sessions given the time required to complete and greater reporting accuracy when completed day-by-day. Additional questions to accompany a diary may include an overall estimate of weekly use (i.e., an indicator of insight or minimization of gaming behavior) and number of breaks when gaming (i.e., an indicator of the persistence of gaming behavior).

Context of gaming and types of games

To complement information about the frequency of gaming, the clinician should ascertain *where* gaming typically occurs. Contemporary gaming in many countries is an activity that most commonly occurs in the home environment rather than public settings (e.g., arcade parlors or LAN cafes) given the accessibility and low cost of home console and personal computer devices. There are, however, portable gaming devices, in addition to gaming applications on smartphones, which means gaming may occur outside the home. The clinician should identify where gaming occurs specifically at home (e.g., bedroom, living area) and elsewhere (e.g., at work, school, or on public transport). This information can help to build a picture of the client's level of commitment to gaming, the extent to which the client feels unable to be without gaming opportunities, and the cooccurrence of gaming with other daily activities.

Information about the genres or types of games played can be a useful starting point for exploring the intrapersonal functions of gaming. Asking the client to name the game or games currently being played may open an exploration of the basic appeal of gaming. Different genres are known to have different psychological effects on players. A study by Smyth (2007), for example, had groups of participants play different types of games over the course of 1 month and assessed the consequences for socializing and work. The authors reported that massively multiplayer online games (MMOs) were more interfering than all other types of games.

"Genre" is a somewhat weak classifier of games. It may be akin to describing an alcoholic cocktail by its menu name and not reporting the percentage of alcohol volume. James and Tunney (2017) argued that it is more useful to know precisely where the positive reinforcement (rewards) comes from in the game in order to understand its addictiveness. Having an understanding of the client's preferred game informs psychoeducation (e.g., discussing how structural features in games can develop unhelpful expectations) and may be incorporated creatively into explaining the function of therapeutic tasks. For example, the principles of exposure therapy may be explained by referring to progression through graded stages of increasing difficulty as it would occur in a video game.

Knowledge of the game(s) played by the client can help to identify the meaning and significance of gaming achievements and their link to certain schematic beliefs. This could be initially explored with questions such as "*What makes the game special for you?,*" "*When you reached [that level in the game], did it make you feel any different from usual?*," or "*What is your strongest memory from playing the game or [the genre] in general?*". Responses may refer to specific modes of play (e.g., competitions, "raids"), expected or desired events or rewards, or in-game goals which may help to identify the client's cognitive and affective processes in IGD. A Socratic

questioning approach may then elicit "I am…" statements related to gaming that may develop an initial hypothesis about the clients' core beliefs.

Beliefs about games

The client is likely to hold strong beliefs about the significance of gaming in their life. Chapter 4 provided a detailed summary of the types of decision-making biases and dysfunctional beliefs about gaming that underlie problematic gaming. To begin, the client may be asked whether he believes there is anything "special" about gaming as compared to other activities. This line of questioning may include questions such as "*What makes gaming different from other activities in your life?*," "*Do you feel like a different person when you are gaming?*," or "*Does gaming make you more similar or different to people you know?*" Client responses may refer to beliefs about the importance of gaming activities, gaming achievements, and/or the ways in which games may help overcome perceived deficiencies in personal aspects of life (e.g., lacking control, mastery, or life purpose outside of gaming) including social relationships (e.g., lack of belonging or social bonds in the real world) or work (e.g., games make sense compared to events in an unpredictable workplace).

A practical task that may be engaging for adolescents involves using a visual representation of the client's "two selves" or identities when gaming versus in the real world. This can be presented by two circles drawn on a whiteboard or shared piece of paper. The clinician may introduce this exercise by saying: "*You said you prefer to play games that allow you to role-play different characters. I am curious about whether there are aspects of your personality that change when you play games. What kind of person are you when you play games?*" This may identify whether the client has a gaming persona or identity, including whether the client plays games to compensate for negative self-perceptions (e.g., "*I am worthless when not gaming*") (Li, Liau, & Khoo, 2011).

Some clients, particularly adolescents, may misconstrue questions about gaming as an invitation for the client to "show-and-tell" knowledge of games or gaming devices or share videos of games on their phone and may, therefore, require gentle reorientation to discuss the client's personal experiences of problematic gaming.

Motives for gaming

Games offer a diverse range of play experiences and clients will report different reasons for playing. Typical motives include escape, mastery, challenging oneself, socializing, exploring, and competing against others. Research literature on the motives for gaming has provided helpful reference points for potential indicators of healthy and problematic gaming (Ghuman & Griffiths, 2012; King and Delfabbro, 2009a, 2009b; Mills, et al., 2017; Yee, 2006). Problematic gamers tend to have much stronger motivations to play than normal gamers across all types of motives. A study by Kuss et al. (2012), for example, reported that escapism as a motive for play was more often endorsed by problematic gamers than normal gamers. Another study of 418 gamers by Laconi et al. (2017) reported that different game genres were associated with a

Table 5.2 Types of motivations for gaming (Yee, 2006)

Achievement	Social	Immersion
Advancement Progress, power, accumulation, status	*Socializing* Casual chat, helping others, making friends	*Discovery* Exploration, lore, finding hidden things
Mechanics Numbers, optimization, templating, analysis	*Relationship* Personal, self-disclosure, find, and give support	*Role-playing* Story line, character history, roles, fantasy
Competition Challenging others, provocation, domination	*Teamwork* Collaboration, groups, group achievements	*Customization* Appearances, accessories, style, color schemes

variety of motives to play, and problem gaming was associated with higher social, escape, fantasy, and coping motives than normal play. Table 5.2 presents a summary of common motivations for gaming based on Yee's (2006) model developed by survey and ethnographic work with thousands of MMO players.

There are some brief scales for gaming motivation (e.g., the Gaming Motivation Scale [GAMS]; Lafrenière et al., 2012); however, these may not be necessary for assessment purposes and could be less client-centered in session. Instead, the clinician may want to simply ask open-ended questions that refer to broad areas of motivation, such as achievement, socializing, or immersion. An example question with preamble may be: "*Many people play games because they expect it to benefit them in some way. With this in mind, let's try to understand what motivates you to play games. What do you consider important aspects of gaming for you?*" The categories listed in 5.2 may be useful prompts, e.g., "*Does playing [the game] ever give you a sense of feeling powerful? Can you tell more about that?*"

Connecting these motivations to emotional states will greatly assist the case formulation. Some clients may report gaming "amotivation," meaning that they engage in gaming without a sense of purpose or drive. Amotivation may be associated with anhedonia related to diminishing reward sensitivity (i.e., usual game rewards no longer being exciting) or frustration due to having increasingly narrow requirements of games to feel satisfaction (King and Delfabbro, 2009a, 2009b). For example, a MMO player with IGD may feel amotivated when he is not able to participate in activities that offer the possibility of high-level rewards or game items or feels that there is nothing meaningful left to do in the game.

Activities that support gaming

Gaming is unlikely to be the only online activity engaged in by the client. Individuals with IGD often spend a great deal of time engaged in other activities that relate to or directly support their gaming behavior. These activities are important to identify because they may act as triggers or maintaining factors for gaming or create or exacerbate other problems (e.g., low mood, inactivity, or social isolation).

Examples of *online* activities that support gaming include: (1) listening to gaming-related podcasts or watching recorded footage of games, e.g., *Youtube* or *Twitch* channels; (2) viewing or participating in online gaming forums; (3) reading news, wikis, or guides about games; and (4) checking websites or online stores for new or discounted gaming software or equipment. Examples of *offline* activities may include: (1) visiting gaming stores to browse gaming products; (2) organizing a gaming collection (e.g., game boxes and equipment); and (3) making lists of current gaming goals and upcoming gaming releases.

Like video gaming, the above activities are not inherently problematic. However, they may relate to the increasing priority given to gaming in the client's life, and the broader behavioral patterns that initiate and maintain gaming. Many of these activities may be an antecedent to gaming activities or make gaming more accessible, and therefore, warrant inclusion in any therapeutic plans that aim to modify gaming behavior. For example, individuals with IGD may have shortcuts to games on their personal computer, which may trigger unhelpful facilitating beliefs such as "*I will only play one game and then stop*". Similarly, browsing gaming discussion boards (e.g., gaming "subreddits" filled with thousands of posts written by other gamers) may fuel preoccupying thoughts of a game.

Financial expenditure on games

IGD is generally much less financially damaging than other addictions, for example, gambling disorder (Langham et al., 2016). There is no reference to excessive spending on games in the DSM-5. Gaming activities have a relatively low cost of entry (e.g., a mid-range personal computer or home console and associated software) and minimal running costs (i.e., online subscription fee, electricity, and internet service fee). Experienced gamers often expound the relatively minuscule *cost per hour* of gaming compared to other activities; problematic gamers may refer to such economic comparisons to justify gaming as "time well spent." However, some players may spend more than they can afford on games. Financial expenditure may, therefore, provide a useful indicator of the escalating use and prioritization of gaming. Some scholars have even referred to the need to make constant upgrades to gaming hardware or to buy new games as a form of tolerance in IGD (Weinstein & Lejoyeux, 2010).

Some games have monetization features (e.g., "microtransactions") that enable players to buy virtual items (Gainsbury et al., 2016; King et al., 2016). These are typically small purchases that can be made repeatedly. Some anecdotal cases suggest that players, typically adolescents, overspend and accrue significant debts on credit cards making these purchases. Impulsive clients may be particularly at risk of overspending on microtransactions. Clients who report uncontrolled spending on games should be asked about the financial impact and whether others (e.g., partner or parents) are aware of these purchases (i.e., an indicator of secrecy or deception).

Social circumstances of gaming

Gaming may occur online or offline, or a combination of both. It is helpful to know the social context of gaming activity, including who the client tends to play with and

the nature of gaming-based relationships. Some players may develop friendships with other players and come to rely on their online presence and cooperation to make advances in the game. Similarly, other players may rely on the client and together develop a routine of gaming whereby their participation is required and becomes a social obligation.

Some clients may report a "fear of missing out" when unable to play with others in their typical group (e.g., "clan," "guild," or "team"). Similarly, they may feel social pressure to play at times when they may have other commitments, or continue playing when they would have otherwise stopped, out of fear of the social consequences (e.g., being "replaced" by another player). Some useful questions in this general area include:

(1) whether the client plays games *with others* online and their social status (e.g., friends, acquaintances, strangers);
(2) whether online friends are *known in real life*, or they would like to meet them;
(3) whether they feel *more comfortable* being with others online versus the real world;
(4) whether they feel they have *social obligations or pressures* to play, such as being a member of a group that has expectations or informal "rules" for shared activities; and
(5) whether they feel any *special bonds* (e.g., sense of belonging) to a gaming group. Note that it is not problematic nor uncommon to make online friendships.

The aim is to determine what social influences are exerted on the client's gaming, as well as the client's personal meaning of social status in online games. This information may help in developing a plan for long-term management of problematic gaming by identifying the social risk factors for excessive gaming.

Family support or other issues

The presence of other gamers in the family should be assessed. Gaming behavior may be facilitated by a sibling or an adult (e.g., father), including persons who may not reside with the client but interact online. The intergenerational influence (e.g., norm-setting or modeling influence) of parent gamers on children and adolescents is currently understudied, but is likely to be an issue of increasing relevance given that gaming is popular among all age groups, including older adults who grew up playing games and now raise their children to coplay games with them (Brand, 2016). A close family member who is an active gamer that plays regularly with the client may be an enabling influence and may potentially undermine the capacity of the client to take responsibility for his actions by normalizing their gaming (e.g., "*It's not a problem if Dad is playing too*"). Permissive parenting is another contributing influence, referring to a lack of boundaries around gaming resulting in extended play.

Education or employment issues

Neglecting responsibilities to play games is a common consequence of IGD, but some life roles or responsibilities may have influenced gaming behavior itself. School or university and work can have a stabilizing effect in some cases. There may also be

some negative effects in other cases, such as high levels of stress or pressure to perform in these roles that contribute to a sense of dissatisfaction, incompetence, or lack of fulfillment that motivates the client to escape into gaming activities (Kardefelt-Winther, 2014).

Adolescents with severe IGD have often disengaged from school for significant periods of time (e.g., more than 6 or 12 months) before entering therapy. Therefore, it is useful to know whether there were any preexisting difficulties in these areas that may have led to using gaming as a method of coping. An early goal in therapy for clients with IGD is developing coping strategies and making other changes necessary to enable reengagement with school or work at premorbid levels. This will often require coordination with school personnel and/or other supports or agencies to develop a plan for achievable reintegration.

Health problems and psychological problems/comorbidity

Some clients have health and/or psychological issues that either result from, or are integral to the development of, gaming disorder (Desai et al., 2010; Gentile et al., 2011; King and Delfabbro, 2009a, 2009b). The presence of health or medical problems can sometimes motivate people to change or improve lifestyle or quality of life, but they can also facilitate more intense patterns of gaming due to client's distorted beliefs, e.g., "*There is no point doing anything other than gaming since I'm too sick, in pain, or going to die anyway*." The nature of the health issue may be less relevant than the client's perception of its impact. For example, experiences of pain or past injuries may lead some clients to believe that physical movement is much more restricted than is the case, which forms the justification for gaming until they are "better."

Similar barriers may arise from thoughts stemming from mood disturbances, including depression and anxiety, which compromise the client's judgment about coping and life prospects, e.g., "*I am worthless*," "*everything is terrible except for games*," "*I can't cope without gaming*," or "*I'm not capable of stopping my gaming now*." Gaming may be seen as a sanctuary that offers personal safety, control, or predictability in the face of unpredictable circumstances (Chak & Leung, 2004; Floros & Siomos, 2012; Lewis et al., 2008) and may also serve to regulate otherwise unpleasant mood states (Billieux, Deleuze, et al., 2015; Billieux, Schimmenti, et al., 2015; Snodgrass et al., 2014).

Functional analysis

A functional analysis involves identifying the client's thoughts, emotions, and behaviors that occur in a typical situation that involves risk of gaming. In the client's own words, an example situation might be: "*I felt stressed out about homework and was alone with the gaming console in my bedroom*." The aim is to develop a step-by-step account of the psychological processes involved in the client's gaming activity, to understand the antecedent events, triggers, decision-making processes,

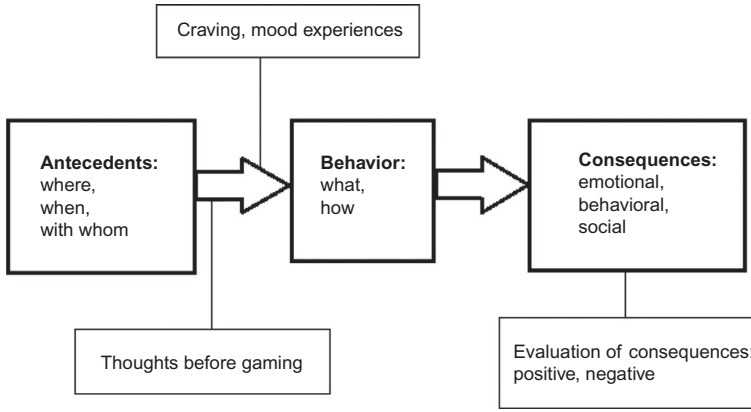

Fig. 5.2 A basic functional analysis.

and consequences of behaviors. The more detailed and accurate the information, the more easily the client and clinician will be able to make predictions about the client's gaming-related choices, behavior, and consequences.

Functional analysis involves the process of reconstructing a scene. It may be compared to the player loading into a new level in a game or compared to how a movie can be operated (i.e., pause, slow down, or replay the action). The aim is to collect important information about gaming situations including: when it takes place, what game is played and with whom, and what happens as a result. The basic ABC steps involved are:

A*ntecedent* (where, when, with whom);
B*ehavior* (what, how); and
C*onsequences* (emotional, behavioral, social).

Additional aspects include: thoughts before use, craving or other mood experiences, and evaluation of the consequences. A general explanation of gaming behavior may inform the more detailed case formulation that then becomes more established over time. Fig. 5.2 provides a template of the functional analysis components.

Developmental profile

The client's developmental profile should include relevant information from social history, educational attainment, medical history, psychiatric history, vocational history, family factors (genetic risk factors, family mental illness), relationship history, developmental milestones, personality development, and significant life events. It is beyond the scope of this chapter to review all of these components in detail. However, the overarching aim is to identify past experiences that develop an understanding of the types of messages that the client received about himself, others, and the world, which form the foundation of his beliefs. Many of these beliefs are likely to help explain the function of the client's gaming behavior.

This broad assessment may require multiple sessions of systematic questioning. However, this does not mean that exhaustive detail is required or more useful for the clinician or client. The emphasis should be on identifying those factors and experiences that are relevant to the development and progression of problematic gaming. For example, a discussion of personality of the client does not necessarily require extensive questioning or administering an inventory, but may begin with some screening questions such as "*How do you generally get along with other people?*" followed up with other questions (as required) in relation to *trust* (i.e., paranoid tendencies), *emotional instability* (i.e., borderline tendencies), *inferiority* (i.e., anxious type), or *solitude* (i.e., schizoid type). The clinician may then examine how these tendencies may be served or compensated for by gaming activities, e.g., gaming due to feeling detached or too anxious to engage with others.

Reasons for seeking treatment

Individuals referred to clinicians for problematic gaming will have different reasons for seeking or entering treatment. A clinician may ask this simply: "*Why seek treatment now?*" Many adults with IGD who seek help may be doing so for the first time, despite having experienced gaming-related problems for 12 months or longer. In a recent study of 186 adult problematic gamers, with most having long-term gaming-related problems, 61% had never previously sought counseling or psychological help (King et al., 2018). This may reflect low help-seeking rates among young males, as well as some of the challenges faced by clients with IGD in locating appropriate help, particularly in the West.

Information about the reasons for seeking treatment is useful because it relates to the client's readiness to change gaming behavior and motivation to engage in treatment (see *Stages of Change* model; Prochaska & DiClemente, 1992). Clinicians should be mindful that some clients may try to appease the clinician by saying what they believe is expected in order to reduce the therapy engagement, such as an overstated or vague desire to make changes (e.g., "*I really want to stop gaming 100%, I'm finally done*") or stating that success has already been achieved since booking the first appointment (e.g., "*Things are already getting better for me, so I don't really need this*"). Clients may avoid expressing their personal views about their gaming and instead give the views of family members, friends, and/or other gamers. This avoidance might indicate that the client feels anxious or uncomfortable with personal disclosure, meaning that a greater focus on establishing client rapport and trust may be necessary to help confront the reality of the situation.

Despite the existence of popular theoretical models (e.g., Protection Motivation Theory) that draw connections between the recognition or risks and problems and help-seeking (Jordan & Oei, 1989), adolescents with probable IGD often do not tend to enter therapy by choice and may not admit that their gaming is a problem, even in the face of objective evidence (e.g., fights and conflict with parents, or school failure or dropout). Individuals with IGD who voluntarily seek help or treatment by

self-referral will often show more insight into their problematic gaming than those who feel coerced into treatment. For example, a 29-year-old male with IGD seeking online support in one of our recent studies demonstrated this insight when he reported, "*I'm tired of putting off life and hating myself in the process. I'm wasting so much time consuming content and learning nothing about myself and what I want to do with this limited amount of time I have. I'm ready to start living life and to stop wasting it.*"

The anticipation of future harms due to gaming may be cited as one of the reasons for seeking treatment. Another young male with IGD reported: "*I'm about to have my first child and I'm concerned that my gaming habits might cause me to miss really important moments. I guess I'm considering the opportunity cost of a life spent gaming.*" Clients with ambivalent or conflicting views about their gaming may benefit from a motivational interviewing approach.

Treatment goals and expectations

It is important to bear in mind the typical goal intentions of clients with gaming disorder (e.g., *controlled* gaming vs *abstinence*). Activities involving electronic media and the Internet are ever-present and have become an essential feature of modern life for work, education, and socialization. Total cessation of gaming and/or use of electronic devices may often be impractical and counterproductive to a normal lifestyle. In a review of the long-term benefits of treatments for gaming disorder, we found that, in all eight reviewed studies, the participants' treatment goal was controlled use of games, rather than quitting games indefinitely (King & Delfabbro, 2014a). Similarly, a recent survey of problematic gamers who visited a self-help website designed to help people "quit" gaming found that only 53% of site visitors had an intention to quit gaming (King et al., 2018). Many respondents simply wanted help to take a break and then play less frequently.

Teenage boys are especially unlikely to want to quit or greatly reduce their gaming. A recent study evaluated a therapeutic residential camp for teenagers with IGD where those in treatment could not play games for 9 days (Sakuma et al., 2017). Participants reportedly continued to play games every day after returning home from the treatment camp. Therefore, it may be expected that many clients with IGD will express a desire to continue gaming.

Controlled gaming may be the most common treatment goal, which may involve modifications to aspects of the client's gaming routine (e.g., not playing certain gaming types or genres, online modes of play), to develop new attitudes toward gaming as a "hobby" rather than a serious obligation. The client may work toward achieving secondary goals such as developing new coping or problem-solving strategies and participation in new hobbies or social activities. As a rule of thumb: The more that the individual with IGD reduces their gaming participation, the greater the need for replacement activities or skills to fill this void.

Treatment history and outcome

Clinicians benefit from knowing the client's previous interactions with service providers. Past interactions that have written records of correspondence or reports (e.g., assessments, therapy exit letters) and/or statements of the outcomes of these interactions are useful in developing a timeline of the client's knowledge and attempts to address gaming problems. The clinician may ask the client: "*Have you sought help for this issue before? What worked or was helpful, and what did not help?*" These questions may also help to build trust and lay the foundation for treatment as a collaborative process.

Open discussion of treatment history may help the client to learn from previous attempts to change, decatastrophize any perceived "failures," and build optimism or confidence in the new therapeutic relationship. Even if the client has previously encountered the same type of therapy that is being offered by the clinician (e.g., CBT), a fresh introduction of the therapy may help to reset expectations and provide the opportunity for the client to bring forward any queries about the treatment.

Case formulation

Assessment of problematic gaming is a continual process that occurs throughout therapy, as the clinician develops new assumptions about the client, or revises aspects of their understanding, as new information comes to light. The information obtained from the above topic areas may be sufficient to develop an initial case formulation, that is, the clinical hypothesis that aims to capture the known range of recurring cognitive and behavioral factors that are interrelated with a range of maintenance processes. The case formulation is developed collaboratively and is shown to and checked by the client. A shared formulation that is incomplete is better than a more thorough, independently developed formulation that is not shared with the client. Readers are advised to consult Chapter 6 for a detailed explanation of case formulation of IGD from a cognitive-behavioral perspective.

Gaming problems: Misuse or mischief?

Researchers have long been aware that many individuals who participate in self-report studies are prone to reporting biases. Sometimes the participant has an awareness or expectation that the researcher wants a certain type of response and provides it in order to be a "good" participant. A recent study by Przybylski (2016) identified the opposite problem: participants giving *deliberately false* responses—that is, being "mischievous." In a study of more than 11,000 adults, participants were administered an online survey that queried their gaming habits and IGD symptoms. The survey contained a lie

detection item, "*In the past year, I have played the game Semeron Online*," referring to an online game that did not actually exist. The broader survey responses of those who endorsed the item were compared to those who did not. The results indicated that "mischievous responding" (about 2% of the total sample) was positively associated with the number of IGD symptoms endorsed.

While the fact that the survey was online and anonymous likely contributed to the rate of mischievous responses, the study highlighted that mischievous (or careless or exaggerated) responding may increase the perceived severity of client's problems. In our experiences with surveys of adolescents (13–17 year olds), the rate of mischievous responses can sometimes exceed 2% based on inconsistent responses or bizarre answers to free response or open-ended questions. In face-to-face clinical assessment, mischievous responding may be relatively rare, but it could manifest in some populations with personality issues (e.g., antisocial type) or, more commonly, as a form of social immaturity or ego-protective mechanism that aims to divert attention away from the real issues that need attention in therapy.

Screening: Choosing the right tools

Clinicians are often faced with the critical task of selecting the most appropriate available psychometric tool for an assessment of various disorders in childhood, adolescence, or adulthood. This task is challenging in the field of IGD, given the numerous clinical formulations and assessment tools that have emerged in empirical research and clinical intervention studies (King et al., 2013, 2017). Given the varying definitions and clinical indicators of problematic gaming, it is perhaps predictable that a large number of different assessment approaches and tools have been developed. Some researchers have also attempted to combine or mix theoretical models of pathological video gaming by developing composite instruments, i.e., measures based on a combination of selected items from multiple instruments (Chou & Ting, 2003; Smahel, Blinka, & Ledabyl, 2008). Adding to the variability in approaches, there have also been well over a dozen tools intended for screening generic "Internet addiction" used for IGD-related purposes (see Lortie & Guitton, 2013).

Some common pitfalls in screening

There has been a deluge of screening tools for gaming-related problems published over the last decade. This has followed the growing study of seemingly any and all possible excessive behaviors involving digital technologies as new "addictions" (e.g., use of social media, smartphones, or apps such as *Tinder* and *Instagram*). There is an understandable desire among some researchers to develop the "first tool" to reap the perceived benefits or advantages of being the first to market (e.g., scholarly recognition, academic promotion, financial gain, article citations, use by early adopters).

In the IGD field, there are now arguably *too many* scales available, as indicated by the many tools with very similar names and constituent items. This creates uncertainty among researchers and clinicians in choosing an appropriate measure, as well as unnecessary measurement variation across studies due to small but appreciable differences in conceptual grounding, items, and scoring thresholds. There are also some weaknesses of certain items in available screening tools that warrant acknowledgement. Common problems relate to inappropriate terminology or language. The following common pitfalls in screening will be highlighted with reference to practical examples:

1. Some screening questions overcomplicate or do not match the underlying concept

Adapting addiction concepts that were intended to apply to drug use to non-substance-related behaviors presents challenges in regard to conceptual consistency. One example of this difficulty can be found in the 9-item Problematic Video-game Playing (PVP) test developed by Salguero and Moran (2002). Item 6 on the PVP test states "*When I lose in a game or have not obtained the desired results, I need to play again to achieve my target*". The authors state that this item measures "loss of control." While a need to play again or repeatedly may be a good behavioral indicator of persistence, which may be associated with loss of control, most of the wording of this item appears to refer to the act of reducing cognitive regret (i.e., correcting mistakes) rather than directly measuring impaired control over gaming. Another limitation is the reference to a specific situation in a game (i.e., losing), when it would be expected that winning is associated with impaired control experiences too. A simpler approach would be to ask more directly, e.g., "*Have you have lost control over your gaming?*"

2. Some questions refer to behaviors that are not inherently problematic

Some screening tools mistakenly include items that refer to normal, everyday experiences, which are not pathological. This may be due to error or basic misunderstanding of problematic gaming. The most widely used measure in the field of Internet addiction, the Internet Addiction Test (IAT) developed by Young (1998), refers to making online friendships (i.e., Item 4: "*How often do you form new relationships with fellow online users?*").

Another similar example is Item 11 in the Problematic Video Game Use Scale by Topor et al. (2011), which states: "*I play video games with other people*." While online social activities were relatively unusual in the late 1990s prior to mass adoption of the Internet, online relationships (and games that involve playing with other people, even those without any obligation to socially interact) are now commonplace. Playing games with others obviously should not be considered a problem by default. Treating online social connections as inherently problematic and equivalent for scoring purposes to other indicators like relationship conflict (as in the case of the IAT), without any additional contextual information or knowledge of the function or consequence of the online relationship, may lead to pathologizing normal behavior.

3. Some questions may pathologize positive or adaptive behaviors

An issue related to "pathologizing" has been the assumption that certain gaming behaviors are harmful when in fact they may have positive effects for the player.

This issue can arise because there may sometimes be a delicate balance between what is harmful and what is not (Lehenbauer-Baum et al., 2015). However, some screening tools do not make a clear distinction. Some examples of this problem can be found in the IGD-20 developed by Pontes et al. (2014), which includes items about using games as a method of coping (i.e., Item 8: "*I play games to help me cope with any bad feelings I might have*" and Item 14 "*I play games to forget about whatever's bothering me*").

Coping can be either adaptive or maladaptive. While many individuals with IGD may mistakenly believe that their gaming is helping them to cope when in fact it may be harmful, these items are worded such that they would potentially be endorsed by normal people who simply value games for stress relief. The problem lies in the lack of necessary qualification for each item. To avoid this issue, items should specify that gaming is a *maladaptive* coping strategy because: (1) it is relied upon compulsively and (2) coping by gaming exacerbates stress or emotional distress, rather than being beneficial. Clinicians should be mindful not to misclassify positive gaming behaviors because these behaviors might help inform treatment goals, such as developing the client's ability for controlled use of games. Misconstruing the benefits of gaming may also invalidate the client's formulation of how their problems first developed; or promote a distorted view of the client's strengths as weaknesses; or discourage the client from seeking positive interactions with games.

4. *Some questions are transposed from another disorder without justification*

Prior to its tentative recognition in the DSM-5 and ICD-11, some scholars relied upon other conceptualizations of addictive behavior (e.g., gambling, substance use) to develop tools for problematic gaming. Some items that apply to these other behaviors may be a poor fit to gaming. For example, the Problematic Video Game Use Scale by Topor et al. (2011) contains an item that refers to severe financial consequences associated with gaming (i.e., Item 10: "*I needed someone else to give me money I owed due to video game playing*"). This item is based on the "bailout" item often used in measures of pathological gambling. While some problem gamers might spend more than they can afford, this item specifies money was *owed* due to gaming which is less accurate than "making gaming-related purchases." Items with wording that do not quite fit or have less relevance to gaming may potentially misdirect the focus of assessment, require more time than is necessary, and/or frustrate or bore the client.

Recommended screening tools

In this section, we present a series of practical tools to assist clinicians in conducting their assessment of clients with IGD. The aim was to present tools that might satisfy the need to check the level of consistency of the client's symptoms with the IGD criteria, as well as assist in gathering broader information about the meaning of gaming preferences and experiences to help in building a cognitive-behavioral case formulation.

The following measures were selected on the basis of:

(1) *excellent psychometric qualities* (i.e., strong validity and reliability);
(2) *clinical utility* (i.e., the scale yields information likely to be of relevance to case formulation or treatment outcome);
(3) *post-DSM-5 development* (i.e., the scale was developed with the awareness or knowledge of IGD as a proposed disorder);
(4) *publication in reputable journals* (i.e., an indication of work that has passed high-quality peer review), and
(5) *practical considerations* (e.g., readability, ease of use, and interpretation).

The Internet Gaming Disorder Scale

The Internet Gaming Disorder Scale is a valid and reliable test of IGD (Lemmens, Valkenburg, & Gentile, 2015). It should be noted that the name of this test is identical or very similar to many other tools used in the field; therefore, those seeking further reading on the scale should be careful to consult the original source. The scale has a short (9-item) and long (27-item) version. One of the advantages of this scale over many other IGD-related scales is its superior item wording due to careful scale development. As Lemmens et al. note, the IGD criteria are described in the DSM-5 in very broad terms. For instance, the criterion "conflict" is described as "has jeopardized or lost a significant relationship, job, or educational or career opportunity because of participation in Internet games" (APA, 2013, p. 795).

Several researchers have suggested that to distinguish specific aspects of the DSM criteria (e.g., relationship, job, education), items can be broken into discrete components (Petry et al., 2014). Other IGD tests have taken a literal adaptation of the nine IGD criteria to create nine survey items, and therefore, do not provide information about which specific aspect of a broadly defined criterion matches the concept of disordered gaming. For the 27-item version, each of the nine DSM-5 definitions is measured with three items, either through separating core aspects of a criterion into different items or by applying slight changes in phrasing or synonyms. Another advantage of this test is its applicability to both online and offline gaming.

IGD in the DSM-5 refers to a time frame of 12 months in which symptoms have occurred (APA, 2013). In accordance with this temporal rule, every item on both IGD scales is preceded by the statement: "During the last 12 months …" The authors have tested the psychometric properties of the short and long version of the test among a representative sample of 2444 Dutch adolescents and adults. Confirmatory factor analyses demonstrated that the structural validity (i.e., the dimensional structure) of all scales was satisfactory. Both types of assessment (polytomous and dichotomous) are reliable (i.e., internally consistent) and demonstrate good criterion-related validity, as indicated by positive correlations with time spent playing games, loneliness, and aggression and negative correlations with self-esteem, prosocial behavior, and life satisfaction.

Table 5.3 The 9-item *Internet Gaming Disorder Scale* (Lemmens et al., 2015)

Criterion	During the last year…
Preoccupation	…have there been periods when all you could think of was the moment that you could play a game?
Tolerance	…have you felt unsatisfied because you wanted to play more?
Withdrawal	…have you been feeling miserable when you were unable to play a game?
Persistence	…were you unable to reduce your time playing games, after others had repeatedly told you to play less?
Escape	…have you played games so that you would not have to think about annoying things?
Problems	…have you had arguments with others about the consequences of your gaming behavior?
Deception	…have you hidden the time you spend on games from others?
Displacement	…have you lost interest in hobbies or other activities because gaming is all you wanted to do?
Conflict	…have you experienced serious conflicts with family, friends, or partner because of gaming?

Note: All questions are scored as 'Yes' or 'No'. Lemmens et al. suggest that a strict cut-off of six or more 'Yes' responses may be most appropriate for a positive 'diagnosis'. In our view, the most essential items for indicating the presence of IGD include the 'persistence' item, in addition to either the 'conflict' or 'problems' items. The criterion 'Persistence' is comparable to impaired control.

The dichotomous 9-item IGD scale has solid psychometric properties and may be the most practical scale for diagnostic purposes. The 9-item scale is scored dichotomously (i.e., yes/no). Latent class analysis of this dichotomous scale indicated that three groups could be discerned: normal gamers (score < 2), risky gamers (2–4), and disordered gamers (5+). A higher cut-off of six may be used to increase specificity. Overall, the scale is a very useful and straightforward measure for IGD screening and assessment purposes. Tables 5.3 and 5.4 present complete versions of the 9-item and 27-item IGD scales by Lemmens et al. (2015), with permission from the corresponding author.

Gaming Motivation Scale (GAMS)

The GAMS is an 18-item scale designed to assess intrinsic motivation, integrated, identified, introjected, and external regulation, as well as "amotivation" (Lafrenière, Verner-Filion, & Vallerand, 2012). The scale is based on Deci and Ryan's (2000) concept of motivation, which is a highly regarded theoretical framework. Scale items represent a variety of reasons for playing video games. The GAMS has been shown to have a six-factor structure, and the scale demonstrates good validity and reliability. The GAMS is significantly positively correlated with gaming frequency. The scale is brief and readable, making it suitable for clients of different ages. The scale may be

Table 5.4 **The 27-item *Internet Gaming Disorder Scale* (Lemmens et al., 2015)**

Criterion	During the last year…
Preoccupation	…have there been periods when you were constantly thinking about a game while at school or work?
	…have there been periods when all you could think of was the moment that you could play a game?
	…have there been periods when you were constantly fretting about a game?
Tolerance	…have you felt the need to continue playing for longer periods of time?
	…have you felt the need to play more often?
	…have you felt unsatisfied because you wanted to play more?
Withdrawal	…have you been feeling tense or restless when you were unable to play games?
	…have you been feeling angry or frustrated when you were unable to play games?
	…have you been feeling miserable when you were unable to play a game?
Persistence	…did you want to play less, but couldn't?
	…did you try to play less, but couldn't?
	…were you unable to reduce your time playing games, after others had repeatedly told you to play less?
Escape	…have you played games to forget about your problems?
	…have you played games so that you would not have to think about annoying things?
	…have you played games to escape negative feelings?
Problems	…have you skipped work or school so that you could play games?
	…have you played throughout the night, or almost the whole night?
	…have you had arguments with others about the consequences of your gaming behavior?
Deception	…have you lied to your parents or partner about the time you spent playing games?
	…have you hidden the time you spend on games from others?
	…have you played games secretively?
Displacement	…have you been spending less time with friends, partner, or family in order to play games?
	…have you lost interest in hobbies or other activities because gaming is all you wanted to do?
Conflict	…have you experienced serious problems at work or school because of gaming?
	…have you experienced serious conflicts with family, friends, or partner because of gaming?
	…have you lost or jeopardized an important friendship or relationship because of gaming?

Note: All questions are scored as "Yes" or "No." Lemmens et al. state that a precise cut-off for this scale is less straightforward than compared to the 9-item version; however, the endorsement of at least one item in six criterion areas may be a useful cut-off for a positive "diagnosis." In our view, the most essential items for indicating the presence of IGD include the "persistence" item, in addition to either the "conflict" or "problems" items. The criterion "persistence" is comparable to impaired control.

particularly helpful for clinicians with limited knowledge of gaming motives because responses to scale items provide a clear description of the types of gaming experiences and their function for the player. The scale is not fundamentally about pathological use of games, so it can potentially be used to track changes in gaming behavior that align with intended healthier use. For example, the scale may be used to assess the progression of gaming for "introjected regulation" (i.e., a need to play games regularly or gaming to feel good about oneself) to "intrinsic motivation" (i.e., playing games because it is fun or pleasurable). The GAMS may, therefore, be a useful treatment outcome measure.

Example items:

Preamble: *Why do you play video games?*

- …Because it is stimulating to play
- …Because it has personal significance to me
- …To gain awards and trophies or character/avatar's levels and experience points

Gaming-Contingent Self-Worth Scale (GCSW)

The GCSW is a measure designed to assess self-esteem that is staked in the gaming environment (Beard & Wickham, 2016). The scale has a short (12-item) and long (36-item) version. Drawn from self-determination theory (Ryan, Rigby, & Przybylski, 2006) and the cognitive framework of IGD (King & Delfabbro, 2014b), the measure assesses the extent to which an individual relies on gaming to meet self-esteem needs. The scale includes items that reference several domains within gameplay including social (e.g., interacting in a guild), competition, competence, virtue (e.g., helping new players), and character appearance.

The GCSW measure includes three primary domains, including (1) *Validation Seeking*, which reflects the perceived risk that an individual may suffer diminished self-worth if they were to discontinue gaming (e.g., "If I didn't have a gaming life, I would be a second-rate person"); (2) *Competition Focus*, which refers to social comparisons and competition affecting self-worth (e.g., "When I outperform others in the game, I feel better in general"); and (3) *Reward Orientation*, referring to the extent to which self-esteem feedback from virtual rewards may be transferred to the real world (e.g., "When I do better in the game, I feel better in general"). The *Detachment* domain measures the extent to which players feel unaffected by their playing (e.g., "My self-esteem is not related to how well I am doing in the game").

The GCSW is a useful tool for assessment of emotionally vulnerable clients who have become reliant on games for their sense of self-worth and social status. For example, some clients with IGD may hold strong negative beliefs about being "unlovable," "weak," or "out of control," which may be compensated for by playing games that affirm an alternative, opposing view of the client. Another clinical application of the GCSW is its ability to identify the client's perceptions of the consequences of reducing gaming activities, which in therapy can highlight areas where the client may require new coping skills or other strategies.

Example items:

- My sense of self-worth is tied to my overall performance when gaming.
- My self-esteem would decrease if I stopped playing the game.
- Having more achievement points than other players increases my self-worth.

Internet Gaming Cognition Scale (IGSC)

The IGCS is a 24-item measure designed to assess maladaptive gaming cognitions that arise in problematic gaming (King & Delfabbro, 2014b, 2016). Conceptually, the measure aims to expand upon the DSM-5 criterion of *preoccupation* (i.e., persistence, obsessiveness, and intrusiveness of thoughts) to examine the *content* of beliefs about Internet gaming. The scale is based on a four-category framework that includes: (a) *gaming reward beliefs*, (b) *maladaptive and inflexible rules about gaming*, (c) *gaming self-esteem beliefs*, and (d) *gaming for social identity and acceptance*. The scale is composed of a series of self-referent statements to which the respondent indicates a level of agreement.

The IGCS has been validated in a study of 3000 17-year-olds (50% female) who were randomly selected from the Norwegian National Registry for a 3-year longitudinal study (NB: this paper is currently under review). The IGCS was administered in the third wave of the study to 1263 participants (61.7% female) aged 19 years, of whom 2.2% met five or more DSM-5 criteria for IGD. Confirmatory factor analysis indicated that a one-factor model demonstrated excellent model fit. The IGCS has high internal consistency. IGCS scores are significantly and positively associated with total IGD scores, but the IGCS does not appear to be significantly related to time spent gaming, which was also found in another study of Australian adolescents (King & Delfabbro, 2016). The IGCS appears to be a valid and reliable test for use in studies on gaming-related problems and to assess outcomes of IGD interventions that include cognitive-behavioral components.

Example items:

- Rewards in video games are as important to me as anything else in my life.
- I feel more in control when I play video games.
- I would not be able to cope with stress in my life without video games.

Internet Gaming Withdrawal Scale (IGWS)

The IGWS is not a clinically validated test but a modified version of the 6-item Penn Alcohol Craving Scale (PACS; Flannery, Volpicelli, & Pettinati, 1999), which is a measure of alcohol withdrawal symptoms. The PACS assesses frequency and duration of thoughts about alcohol, intensity of alcohol craving at its strongest point, ability to resist alcohol, and overall strength of craving. The IGWS has been used in two independent studies of adolescent and adult gamers temporarily abstaining from games (see Kaptsis et al., 2016). The measure was created by modifying PACS items to

specify gaming instead of alcohol (e.g., "How intense was your desire/craving to play a game at its strongest point?"). A total IGWS score is calculated by summing all individual item responses, with higher scores indicating more intense and frequent symptoms. The IGWS has shown excellent internal consistency in two studies ($\alpha > 0.90$). The IGWS may be a useful tool for cognitive-behavioral therapeutic tasks that involve reducing gaming (e.g., exposure therapy or behavioral experiments), because it is a brief measure of the immediate cognitive and affective reaction to triggers for gaming. The IGWS may assess changes in the client's capacity to resist and cope with gaming activities.

Example items:

- How intense was your desire/craving to play a game at its *strongest point*?
- How often did you think about games or about how good it would be to play games?
- In the past week, how difficult was it to resist playing games?

Summary: A lamentation of swans

Measurement of problem gaming and IGD has been quite varied. For many in the field, IGD screening and assessment is currently guided by the DSM-5 classification or similar models that feature addiction-based items (e.g., Tao et al., 2010). However, the IGD classification has its fair share of critics who claim that it has brought a premature and unhelpful epistemic uniformity to the study of problematic gaming (Quandt, 2017; van Rooij & Kardefelt-Winther, 2017). Some scholars argue that the proposed condition has been a catalyst for the creation of a glut of instruments that simply adapt the wording of the IGD criteria with little consideration to other explanations of the gaming behavior.

Conceptually narrow but psychometrically different measures of IGD have purportedly created a situation of methodological "chaos and confusion" (Kuss, Griffiths, & Pontes, 2017) and, at the same time, stifled broader exploration of the nature of pathological gaming (Starcevic, 2017). IGD is currently positioned in Section III as a "condition for further study" (APA, 2013), but its criteria are more often treated as though they are awaiting final approval, rather than statements in need of empirical testing. What advances will be made by further study if it is confirmatory and all headed in the same direction? From a Popperian perspective (see Susser, 1986), each new tool derived from IGD criteria may offer little more than another white swan joining the lamentation of white swans. These tools can confirm, but cannot disprove, the existence of IGD.

Conceptual and measurement issues related to IGD will undoubtedly continue to be debated. In the meantime, there is a practical need for clinicians to manage referrals for problematic gaming and suspected IGD. This chapter has attempted to show that the assessment of individuals with gaming-related issues requires more than the administration of an IGD checklist. Gaming is a complex activity that occurs very frequently in cases of problematic use. It is necessary for clinicians to gain an understanding of the scope of the client's gaming behavior, its effects and compensatory functions, and its historical and current impact on functioning in the client's life. A detailed picture of

the client and how gaming activities have developed against background factors provide the foundation for case formulation. In cases where clients may present only for an assessment and do not continue with therapy, the assessment itself may hold some therapeutic value for its articulation of the links between the client's gaming and problems, in some cases for the very first time. The areas of discussion in this chapter may also be relevant in improving population surveys of problematic gaming. Information about the context, motives, and functions of gaming behavior can assist greatly in the interpretation of respondents' endorsement of IGD criteria.

Clients are likely to differ significantly in their level of insight and perspectives on the nature of gaming-related problems. Some clients will deny that their gaming has caused problems, despite having completely disengaged from school or work to spend all their time gaming, experiencing low mood and irritability when not gaming as well as during gaming sessions, and regular conflict with a partner or family about gaming activities. Adolescent IGD clients may be in active conflict with the referring party (e.g., parent or carer) who accompanies him to session. Clinicians working with these complicated dyads will have to proceed with a neutral stance and may need to gather information via separate face-to-face interviews.

Reconciling the client and referrer's different views and accounts of the gaming behavior to develop a shared view of the situation is a common challenge. Clients seeking help *voluntarily* may be more forthcoming in their self-appraisal (and open to others' views) of their gaming behavior and its consequences, but will still often feel ambivalent about change. Acknowledging the client's narrative of the positive aspects of gaming may help to build trust and rapport. A nonjudgmental approach is essential to encourage the client to be honest about the more harmful aspects of current gaming behavior and attend further sessions. Ultimately, the objective of assessment is to gather sufficient information from the client, and additional sources as required, to develop a case formulation to guide treatment.

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Case formulation for IGD

6

Chapter Outline

Introduction and overview

The treatment of individuals with Internet gaming disorder (IGD) poses a major challenge for clinicians (Allison, von Wahlde, Shockley, & Gabbard, 2006). A recent study by Dullur and Hay (2017) reported that only 16% of their sample of 289 psychiatrists felt they were confident in managing cases of IGD. As in other areas of recognized addiction, many clients with IGD referred to practitioners and mental health services often present with an array of cognitive, emotional, and physical symptoms, often resulting from many months, or years in some cases, of persistent and all-consuming

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gaming. Such gaming has usually occurred in combination with a range of other Internet use behaviors (e.g., browsing gaming sites and forums, online shopping for gaming software and equipment, or researching game strategies).

Many individuals with IGD will have often suffered from gaming-related harms for a long time before seeking help (Saunders et al., 2017). For example, in a recent study of 186 adult gamers who sought online help and support for problematic gaming, the majority (83%) had experienced gaming-related problems for over 12 months before making the decision to seek assistance (King, Adair, Saunders, & Delfabbro, 2018). Many who require help may refuse to attend. Higuchi et al. (2017) reported that about 40% of adolescents with IGD referred to their specialist service did not attend appointments. Another challenge is that a range of comorbid difficulties are common in IGD. Such problems can include depressive, socially anxious and obsessive-compulsive symptoms, sleep-wake cycle disturbances, and attention deficit problems. Although autism spectrum disorder or related developmental issues have also been singled out as features of some referred cases, relatively little research on the roles of these disorders has been conducted.

An additional problem, once people meet with formal services, is that it may be difficult to encourage regular engagement or develop an effective therapeutic alliance. The term "therapeutic alliance" refers to the strength of the relationship between clinicians and clients as based on a shared understanding and recognition of problems; common treatment goals; trust and empathy; and a general rapport. Clinical observations suggest that, unfortunately, most adolescents referred for problematic gaming may not be motivated to engage in treatment or share others' views about the need to change (King, Delfabbro, Griffiths, & Gradisar, 2012; Sakuma et al., 2017; Young, 2009). Such clients will often present in an agitated or irritable state because they have had to interrupt their gaming in order to attend therapy. They may report that gaming is the primary way in which they are able to cope with other difficulties, but may be unwilling to work on these areas due to the subsequent need to adjust their schedule of gaming.

In some cases, an adolescent may be in denial and may argue that it is the person who referred them to treatment who is in need of mental health assistance. Along these lines, they may point to their parent's lack of understanding of gaming and constant exhortations to stop gaming as "the problem." Similarly, many adult gamers may express ambivalence about their intentions to change gaming in the context of therapy. Some clients who express willingness to change in therapy may lose this resolve in their usual gaming environment. Accordingly, an individual case formulation approach may provide clinicians with an enhanced means of understanding the client and may help to navigate the initial challenges of therapy, such as establishing client rapport, to provide guidance in treating these clients.

This chapter will begin with a brief overview of the classifications and nature of the IGD. We will then discuss approaches to the cognitive-behavioral modeling of IGD that may be useful in case formulation with clients. Clinical examples will be provided to aid discussion of these issues and demonstrate the practical application of the concepts.

Classification

Defining what problematic gaming is (and what it is *not*) is a necessary starting point. As discussed in Chapter 5, the diagnosis of IGD is currently tentative in the DSM-5 (APA, 2013). It is not currently known when the positioning of IGD as a "condition for further study" may be evaluated for inclusion in the DSM proper. Gaming disorder (GD) (code: 6D61) is proposed for inclusion in the forthcoming ICD-11, which is expected to be released in mid-2018. Hazardous gaming (code: QF33) has also been included in the ICD-11 to refer to a pattern of gaming that appreciably increases the risk of negative outcomes, but has not yet reached a level of severity sufficient to cause harm to the individual or others.

At this stage, the forthcoming ICD-11 will likely be the first diagnostic system to recognize gaming disorder and will likely be the principal reference point for clinicians. However, both the ICD and DSM systems may be consulted by clinicians and researchers for guidance, and particularly the DSM-5 for formulation given its details on symptomatology. For example, the DSM explains in more detail some of the motivational features of IGD that include gaming to compete with other players online, playing to "avoid boredom," and the desire to play at night or for extended periods of time to match the playing schedules of others in different time-zones.

Although there has been some opposition to the concept of gaming "addiction" (see Chapter 2), many researchers maintain that there is still a practical need to classify the functional harms associated with gaming. Currently, both proposed classifications in the DSM and ICD systems consider harms in the context of gaming disorder from the perspective that it is an addictive behavior, although the ICD-11 beta draft has a much briefer description that does not refer to several traditional addiction concepts. Most notably, the concepts of tolerance and withdrawal are absent in the ICD-11 description.

The DSM and ICD classifications nevertheless have many similarities, including: *impaired control* over gaming; *preoccupation*; and the *increasing priority given to gaming* as well as gaming that causes significant *impairment* in numerous life domains. There are also some overlaps between IGD and gambling disorder in the DSM-5, as well as substance-based addictions. While there has been uncertainty regarding whether IGD refers only to online games (and not offline games), the DSM-5 provides an explicit explanation that IGD refers to all types of video games and excludes those which involve gambling.

While the ICD-11 refers to online versus offline gaming subtypes, our view is that this distinction may create some unnecessary complications for case formulation given the definition of "online" gaming is not straightforward, and the relevance of the online connection may sometimes be of marginal importance to understanding the motives and maintaining factors for clients. Similarly, IGD encompasses electronic gaming across all types and platforms (devices). While researchers have proposed subtypes of Internet addiction based on applications, there have been no attempts to create subclassifications of IGD based on gaming applications or devices, such as those described in Chapter 1. For these reasons, the most typical and accepted approach to formulating IGD is to consider the disorder as a *gaming-specific subtype* of behavioral addiction with many of the same clinical features as gambling and substance-based addictions.

What is the core psychopathology of IGD?

Gaming disorder refers to a dysfunctional adaptation by players to gaming environments, activities, or situations. This dysfunctionality is defined primarily in relation to evidence of *impaired control* over gaming behavior. Impaired control, in this context, refers to an inability to resist the urge to commence gaming sessions or to be unable to stop once gaming activity has begun. Historically, much of the discussion has revolved around situations largely confined to the use of screen-based amusement machines and home gaming consoles. Such gaming technologies have been highly popular and widely used since the beginning of the 1980s and have become increasingly more popular over time. There are some historical records of compulsive use of computers (e.g., programming, optimizing builds) that predate the recognition of problematic gaming, as well as previous concerns of young people engaged excessively in fantasy role-playing games, board games, and comics—activities that lack a digital technological format but have some features in common with video games in terms of skillful play, knowledge-building, wish fulfillment, and being time-consuming.

Impaired control over gaming is likely to develop because of motivational factors that compel people to return to the activity (King & Delfabbro, 2009; Mills, Milyavskaya, Heath, & Derevensky, 2017; Yee, 2006). Many gamers have strong motives of wanting to solve or complete the game; "*escape from the real world*" and "*take on a new identity*," although these features are arguably a normal aspect of play too. IGD is not considered a culture-bound syndrome, but the disorder is known to be much more prevalent in East Asian countries than throughout the West, for reasons thought to be related to greater urbanization; online infrastructure; accessibility of gaming products; achievement-oriented cultural values; stronger family pressures to succeed academically; and a lack of other available leisure activities in very built-up environments (Lim, 2012). Some comparisons have been made between IGD and *hikikomori* (self-enforced isolation) in Japan, but the underlying psychopathologies appear to be quite different (Stip, Thibault, Beauchamp-Chatel, & Kisely, 2016).

The DSM diagnostic criteria for IGD refer to an "inability to control one's gaming" as one of its central psychopathologies. More broadly, one observes references to a *loss of control* as a key component of all types of addictive disorders and specifically those involving behaviors rather than the ingestion of a substance (Goodman, 1990). Such elements help in explaining the persistent use of gaming despite the presence of escalating problems and harms resulting from gaming. Models of addiction have also made formal reference to structural elements of gaming applications and activities and how these possibly contribute to problematic behavior, e.g., a user's obsession with gaming items, rewards, achievements, and identities.

In one of the earliest described psychiatric cases of IGD, a problematic online gamer "*put on a new identity like a new suit of clothes, becoming someone who walked on water, healed others, and cast lightning bolts, in stark contrast to his daily experience of himself as inadequate*" (Allison et al., 2006). Moreover, referring back to our earlier discussions on the role of cognitive factors (Chapter 4), it is likely that a core feature of IGD may be uncontrolled gaming to compensate for negative self-evaluations and/or negative schema. Individuals with IGD believe that they are *powerless* or un-

able to exert control over their gaming behavior, which is maintained even in the presence of contradictory evidence by all-or-nothing thinking. This has clear implications for the cognitive-behavioral formulation of the disorder.

Models of gaming disorder revisited

Several models of problem gaming and IGD have been proposed within the last two decades. Many of these models have referred to disordered gaming behavior as a single part of a larger constellation of Internet use problems. One of the first models of pathological Internet use (i.e., not gaming specifically) by Davis (2001) proposed that problem users held a negative view of themselves and used the Internet (which may include gaming) to achieve positive social interaction and feedback from others. Problem users have negative thoughts about the world, characterized by overgeneralization and arbitrary inference: for example, "*The Internet is the only place I can feel safe*" or "*Nobody loves me offline.*"

A similar model published by Caplan (2010) proposed that pathological Internet use was maintained by a "preference for online social interaction" (POSI), referring to the belief that the individual was safer, more efficacious, more confident, and more comfortable with online interpersonal interactions and relationships than with face-to-face social interaction. A related psychological effect is the "online disinhibition effect" (Suler, 2004), which refers to the general tendency for individuals to feel more outgoing and extraverted in online social interactions, due to the user's anonymity and perception of fewer social risks online.

Some recent models have attempted to integrate new knowledge of the neurobiological bases of problematic gaming behavior. Dong and Potenza (2014) and their colleagues have conducted neuroimaging studies which have led to a cognitive-behavioral model of IGD that describes three primary domains to explain addictive gaming. These domains include: (1) motivational drives related to reward-seeking and stress-reduction; (2) behavioral control relating to executive inhibition; and (3) decision-making that involves weighing the "pros and cons" of engaging in motivated behaviors. An advantage of their model is its conceptualization of the interrelationships of neurocognitive and affective processes and behavior. For example, the model explains how some online experiences may develop neurocognitive differences and reinforce affective responses among users. Additionally, the model highlights multiple points of intervention, such as strengthening cognitive capacities to inhibit online gaming behavior.

Another recent model for Internet-related disorders was proposed by Brand, Young, Laier, Wölfling, and Potenza (2016), termed the Interaction of Person-Affect-Cognition-Execution (I-PACE) model. The model describes the role of positive and avoidance expectancies, false beliefs about the effects of online applications, and implicit associations with Internet-related cues in maintaining excessive Internet use. A strength of the model is its comprehensive view of Internet use behavior, including the biopsychosocial vulnerabilities of the user. However, the I-PACE model applies broadly to a range of online activities rather than gaming specifically. Clinicians may

face some practical challenges in adapting the I-PACE to clients' unique decisions to play games rather than other online applications. For example, dysfunctional attitudes, positive expectancies, and attentional bias may require further operationalization of the context, content, and use of gaming for each client.

Known unknowns in CBT

Cognitive-behavioral therapy (CBT) is generally the most widely used clinical method for addressing gaming-related behaviors (King et al., 2017; King, Herd, & Delfabbro, 2017) and this is also true of the gambling literature (Merkouris, Thomas, Browning, & Dowling, 2016). For example, in the past decade, there have been 24 IGD treatment studies that have employed a psychological intervention that involves either a full course of CBT (usually 6–8 sessions) or incorporates some CBT techniques into a multi-model treatment plan (King, Delfabbro, et al., 2017; King, Herd, & Delfabbro, 2017). A recent meta-analysis by Winkler, Dörsing, Rief, Shen, and Glombiewski (2013) reported that CBT was among the most empirically supported treatment type for Internet addiction (IA) and was particularly efficacious for reducing time spent online and depressive symptoms in the context of IA. The long-term effectiveness of CBT and other treatments is still relatively unknown due to study limitations, such as the lack of comparison groups and follow-up.

Another issue is that the components of CBT in many of these studies are not well-described, making it difficult for others to follow or adapt to their own clinical practice or replicate in further studies. While the models described in the last section have been highly cited in the field for their conceptual advances, there is minimal evidence that CBT treatment studies have been guided directly by any of these models. Similarly, very few structured treatment manuals for IGD exist in public circulation.

The *nature* of cognitive therapy components tends to be poorly described in research studies, perhaps for the understandable reason of parsimony or article word limits. Studies lack references to actual techniques that address generalizations, catastrophic thinking, rumination, and negative core beliefs. Researchers should consider publishing their protocols to make them more transparent and accessible to others, such as providing online supplementary material. Treatment studies employing CBT have tended to emphasize the need for building social and communication skills and learning coping strategies to manage craving and withdrawal symptoms (e.g., Du, Jiang, & Vance, 2010; Li & Wang, 2013; Wölfling, Beutel, Dreier, & Müller, 2014). These strategies align with Davis and Caplan's models that point to the role of withdrawal and craving for games and the lack of real-world social confidence in the initiation and maintenance of IGD.

Overall, there is no single leading cognitive-behavioral model that describes IGD in extensive practical detail for clinicians. The I-PACE model by Brand et al. (2016) is valuable, but has a general focus on Internet use; it has great scope but few gaming specifics. The evidence for CBT remains slim, despite growing international research on interventions. This may reflect some of the inherent complexity and debate regard-

ing the psychopathology of the disorder. The adaptation of symptom criteria from other addiction models, particularly gambling disorder in the DSM-5, has not been followed by a similar adaptation or mapping of the underlying cognitions and motivations of these same addictive disorders to IGD. This is likely because maladaptive gambling cognitions, as an example, are a poor fit to gaming, given the different structural features and player motives in each activity (Delfabbro & King, 2015).

As one example, the concept of "*illusion of control*" in gambling (Langer, 1975) has little relevance to video gaming activities because there is usually a high degree of player control involved in gaming that does not exist in gambling. IGD is instead driven and maintained by expectancy beliefs, unhelpful perceptions and rules related to gaming, and gaming-related self-esteem (Beard & Wickham, 2016; King & Delfabbro, 2014).

Introducing a framework for case formulation

The following sections will present the core components of a framework for case formulation for IGD. This framework aims to capture the known range of recurring cognitive and behavioral factors that are interrelated with a range of maintenance processes. A relatively straightforward CBT-oriented model is adopted in this chapter for parsimony and ease of use among a wider range of mental health professionals (see Chapter 2 for additional models).

To summarize, the presented framework assumes that *early experiences* and *family factors* develop a predisposing set of *negative schematic beliefs*. These beliefs are the foundation for the development of gaming-specific *rules and assumptions* that serve a range of *compensatory functions*, such as gaming to overcome a view of oneself as powerless, weak, or lacking in control. The activation of gaming-specific cognitions establishes a pattern of gaming that is maintained by factors that include *mood-relieving* (i.e., withdrawal-like) effects and an interrelated set of self-reinforcing *intrapersonal and intrapersonal factors* related to gaming. Each of these factors will be described in detail and then two practical examples with clients are provided, with accompanying completed formulations (Figs. 6.1 and 6.2).

Early experiences and family factors

A client's early life experiences and family environment are likely to be important in understanding the emergence of problematic gaming. The backgrounds and risk factors of individuals with IGD have been studied in some detail, with some preliminary synthesis of these factors into distinct IGD subtypes. Individuals with IGD are more often male and have a history of regular or habitual gaming and high availability of gaming equipment and software. However, these features may seem unremarkable given the generally high prevalence of gaming among male adolescents. For example, data from the 2015 PISA study, one of the largest survey studies conducted in the

world, has found that approximately 8.8% of 14,530 adolescents in Australia report playing games daily.

Similarly, survey studies of young adult gamers (aged 18–25 years) tend to report that many adults play games regularly and there are often no significant difference in the histories of gaming among normal and problematic gamers. Many of these players report an age-of-onset of gaming between 5 and 8 years. The *function* of gaming, therefore, becomes much more useful to consider in assessing the potential impacts on the user. Research findings have highlighted, for example, that individuals vulnerable to IGD tend to report having relied on games for *emotion regulation*. Young people with few other interests and a reliance on gaming to cope with stress or to feel excitement tend to be at higher risk of developing IGD.

Familial influences, such as poor parent-child relationship, irregular restriction and monitoring of media use, and unstable marital and socioeconomic status, can influence IGD (Schneider, King, & Delfabbro, 2017). Research has examined the association between adolescent electronic media use and family functioning, with much of this work drawn from East Asian populations (Xiuqin et al., 2010); however, fewer studies have focused on problem gaming. Chiu, Lee, and Huang (2004) reported that Taiwanese youth from families with *higher functioning relationships* (e.g., quality communication and time spent together) had much lower levels of problematic gaming.

Family functioning may be a protective factor against problem gaming because more diligent family members are likely to direct the adolescent's attention away from games and toward other activities. A study of 600 adolescents by Jeong and Kim (2011) reported that less engagement with family activities was associated with problematic gaming. The relationship between family environment and problem gaming may be bidirectional. Excessive involvement in gaming displaces opportunities for family interaction or reduces the quality of interactions, and poor existing family relationships may lead adolescents to seek out social engagement in gaming activities (Wang & Wang, 2013).

Another important focus of this literature has been on the role of parental restriction and monitoring of gaming. On the whole, this research has produced mixed findings. Parental restriction of gaming may reduce IGD if it is applied fairly and consistently and if it is initiated from an early age, but such restrictions may be less ineffective or may even exacerbate IGD when implemented too suddenly after signs of problematic gaming are already evident. For example, a study of 2021 adolescents by Wu, Ko, Wong, Wu, and Oei (2016) reported that parent restriction was 1.9 times higher in excessive online users compared to other adolescents.

Media restriction in response to IGD may create a "vicious cycle" of escalating restriction and parent-child conflict. This pattern of parent-child interactions may, in fact, *increase* a vulnerable young person's reliance on gaming to manage stress of parental frustration, hostility, or rejection. These interactions may strengthen the gamer's negative self-evaluations ("*My parent does not like me*") and confirm the ego-protective role of gaming in their life ("*I feel safe when I play games*"). Some cases of problem gaming may, therefore, benefit from family therapy, which aims to repair the parent-child relationship and establish new mutually respectful styles of communication and negotiate healthy rules and boundaries around gaming.

Core beliefs: The self, the world, and others

Cognitive-behavioral conceptualizations of IGD generally recognize that early experiences and family factors can influence the development of core negative schematic beliefs concerning the self, the world, and others. Some beliefs may be broad and nonspecific to gaming, but may form an underlying system of *cognitive vulnerabilities* that provides the foundation for the emergence of specific problematic gaming thoughts and behaviors.

Core beliefs in gaming disorder typically concern themes of powerlessness, incompetence, lack of identity, inability to exert control or experience mastery in the real world, and lack of social relatedness. For example, a dichotomy might be observed in relation to the user's beliefs about the importance of real vs virtual identity. The gamer may prefer to draw a distinction between "true" and "false/fake" when referring to his or her online and offline existence. The virtual world may become increasingly preferred for its perceived safety, authenticity, and familiarity. This may arise when a gamer has poor real-world self-concept (see Dieter et al., 2015) and comes to view their real-world self as empty, insignificant, or deficient. In Allison et al.'s (2006) case study, for example, their client reported, "*I just cannot picture myself being successful*" (p. 381).

As these core beliefs strengthen, there will be increasing disregard for the importance of physical health and self-care, leading to changes in hygiene, exercise, sleep, and dietary balance. The real-world self may come to be seen as nothing more than the agent through which the person gains access to their virtual self. In this way, gaming provides a means of countering negative views of oneself. Individuals with IGD will devote *almost all* available time and personal resources to a game or games, with the aim of becoming more skilled or proficient than other players, in a deliberate attempt to respond to their negative self-evaluation.

For people caught in this cycle of gaming behavior, others close to them who are non-gamers may be viewed as irrelevant, judgmental, or rejecting, and the world outside of games viewed as chaotic, unpredictable, overwhelming, or dull and unrewarding. Real-world decisions and choices may be seen as inconsequential or likely to produce frustration. The prioritization and high personal value placed on gaming pursuits, and the centrality of gaming in the user's routine and lifestyle, promotes a view of others and the external world as being of secondary or minimal importance. These beliefs about the self as powerless, deficient, or empty within an unpredictable, hostile, and unrewarding environment may foster additional beliefs about the value and importance of gaming rewards, activities, and identities (King & Delfabbro, 2014).

Intermediate beliefs: Conditional assumptions, rules, and attitudes

Holding negative schematic beliefs that one is essentially worthless or powerless outside of the roles and identities that are assumed when playing games or being online can be highly uncomfortable or distressing. The act of gaming enables a persona that is mutually exclusive to the real world; it exists only within the boundaries of the game.

"Switching off" is a return to reality *and* a departure from the game world, and both experiences are undesirable. This can be observed in individuals when their gaming equipment or online connection is suddenly removed or indefinitely unavailable. To avoid the activation of negative beliefs and accompanying negative effect, and to compensate for them by moving as far toward an opposing state as possible, an individual may develop a set of conditional assumptions, rules, and attitudes that protect from these painful or distressing thoughts. It is in this way that the individual with IGD justifies his retreat into video games more regularly and for longer periods of time; he increases "pleasure" and avoids "pain."

Intermediate beliefs are developed to compensate for negative core beliefs. For individuals with IGD, these beliefs are often centered on the need for control, certainty, success and achievement, and social recognition and status in order to compensate for beliefs around personal vulnerability, incompetence, lack of identity, and powerlessness. A typical example of beliefs at this level may include the *attitude*, "*Gaming achievements are more meaningful than anything else I could accomplish in the real world*", the *assumption* "*If I can be skilled or achieve a high level in a game, then others will notice and respect me; if I am unable to play games, then my life becomes insignificant and I am worthless*", and the *rule* "*I need to maintain a daily routine of gaming and not log out of a game until I have completed all my goals*". Individuals with IGD strongly believe that they lack personal agency and control in relation to their gaming. Essentially, they believe that they are incapable of controlling their impulse to play games or stopping a gaming session once they have started.

Core beliefs about others and the world may give rise to many types of intermediate compensatory beliefs. For example, the individual with IGD may perceive others who do not play games as irrelevant, judging, or rejecting, and therefore, develop beliefs about the desirability of keeping others at a distance and keeping their gaming identity hidden or minimized. Perceiving the world as unrewarding, unpredictable, and uncontrollable may lead to compensatory beliefs around the need for order, structure, controllability, and personal agency. These beliefs may form part of the schematic background against which an obsession with the rules, contingencies, and structural design of online games may flourish. For example, individuals with IGD often develop inflexible rules for gaming that include strict adherence to completing in-game goals and activities.

Triggers: Why an addiction to games specifically?

A gaming disorder develops when a vulnerable individual discovers and plays certain games. Some players may experience this interaction as a moment of profound change. In cognitive-behavioral terms, individuals who develop IGD have a predisposing set of negative core beliefs that become *fused* with beliefs about the meaning of gaming pursuits and outcomes (Wan & Chiou, 2006). This fusion means that gaming becomes associated with a personal sense of purpose, achievement, mastery, and safety. Beliefs that reflect this fusion might include, "*Being good at games means I am powerful and respected*" and "*My gaming creates order and predictability in my world*" (Beard & Wickham, 2016; King & Delfabbro, 2014).

The meshing of core and gaming-related beliefs that trigger IGD behaviors may occur for several reasons. For IGD in the context of MMO gaming, factors such as social isolation and lack of real-world achievement may predispose the user to perceive links between self-esteem and their online social status and character level progression. Early experiences such as being part of a family that only valued achievement, where those who do not live up to their expected potential were shamed or criticized, may predispose the individual to seek out gaming for its positive reinforcement and its encouraging "*player as hero*" narrative.

Other types of games may have special appeal for at-risk individuals. For IGD that primarily involves offline, story-driven games, the individual may seek a safe, quiet, and/or uncomplicated escape from the real world. This may be desirable for those with histories of traumatic experiences, social anxiety, and/or abusive or conflictual relationships. Solitary gaming in immersive games may provide a cathartic escape from intrusive thoughts and overwhelming emotions. For other individuals, the world of online competitive games may help compensate for perceived inadequacies related to achievement.

Identifying the specific triggers or vulnerabilities underlying IGD for different people may be challenging once a habitual pattern of behavior has been established. This is because gaming-related and core beliefs may become progressively enmeshed and self-reinforcing over time. As individuals with IGD become less involved in and less personally attached to real-world events, relationships, and responsibilities, the gaming world becomes the preferred way of meeting the player's needs. Individuals with IGD become more detached from reality and increasingly sustained by a virtual existence. Games offer *something* that nothing else does.

What functions does IGD serve?

The gaming disorder may be conceptualized as an individual's perceived "solution" to underlying problems that are a product of past experiences and underlying beliefs. This perspective is applicable to many disorders, including addictions. For example, individuals who smoke cigarettes do not do so for the detrimental health outcomes, nor do gamblers play the slots because they wish to lose money. On the contrary, these addictions are often seen by the user to have many benefits and positive features. Along the same lines, individuals with IGD participate in gaming activities because it performs *important functions* as a perceived solution. It is essential to identify these functions in the case formulation.

Intrapersonal functions of gaming

Gaming activities provide a diverse range of experiences and effects for players. In one of our surveys of adult gamers with self-reported gaming problems (King, Delfabbro, & Griffiths, 2011), the most commonly reported motivations for gaming were *advancement* (84% of respondents rated this as "important" to them), *escapism* (83%),

and *mastery* of game mechanics (74%). These findings were consistent with many other researchers' observations of the potential functions of gaming for individuals, which tend to fall into the following categories.

Control

An individual who perceives oneself as powerless or lacking in self-efficacy is likely to have a high need for feeling in control. The interactivity and feedback of games is designed to cater to this need. Gaming activities provide a feeling of being in control even when this might mean adhering to an inflexible routine of playing that leads the gamer to neglect other life activities around the behavior (King & Delfabbro, 2016). The problematic gamer discovers that, unlike school or work or other areas of life, gaming is much more predictable and follows objective rules and contingences that are clear and knowable.

The planning, effort, and practice expended in gaming are almost always rewarded commensurately, unlike real-life endeavors that may not provide regular opportunities, or do not produce fair or desired outcomes (i.e., success). Gaming is seen as secure and dependable, whereas the real world is viewed as unpredictable. Seemingly paradoxically, the act of gaming provides the individual with IGD with a *sense of control*, while, at the same time, the individual may believe that he has *almost no control* over his gaming.

Achievement

Successful control over, and winning in, complex games may be difficult for people with no gaming experience. However, it is something that people with IGD are extremely good at and they strive constantly to maintain their skill level. Their choices in games are usually seen as important and make a difference within the virtual ecosystem of the game. Success and winning in games provides a strong sense of achievement and self-validation (Kuss, Louws, & Wiers, 2012; Lehenbauer-Baum et al., 2015). These experiences are sought after for their temporary disconfirmation of core beliefs related to failure and incompetence.

Individuals with IGD are particularly sensitive to losing in games, such as competitive games, because these experiences can activate negative core beliefs about powerlessness and failure. They may report a "need for completion," referring to a perfectionistic drive to complete all game objectives to feel satisfaction or relief (King & Delfabbro, 2009).

Safety/escape

Individuals with IGD often have core beliefs about the vulnerability of the self within an unpredictable environment. Gaming can provide a sense of safety and escape to compensate for this anxious view of the real world (Kardefelt-Winther, 2014; Snodgrass et al., 2014). The established rules and boundaries of games, and their familiar aesthetic features (graphics, sounds, music), can form a positive impression of the game or device not unlike a trustworthy or dependable companion (Fullwood, Quinn, Kaye, & Redding, 2017; Selnow, 1984). Using games to escape reality may be more common among players of games that feature large immersive worlds with in-

teractive characters and storylines (Billieux, Deleuze, Griffiths, & Kuss, 2015; Fuster, Chamarro, Carbonell, & Vallerand, 2014).

Role avoidance

Gaming disorder can enable avoidance of the demands of responsibilities, maturity, and intimacy. When the gaming disorder develops in adolescence, the individual will often abandon education and social activities with peers and pursue very few, if any, other activities in the real world (Richardson, 2016; Schneider, King, & Delfabbro, 2018). This retreat from daily living forms the beginning of forming a new identity constructed by the world, events, and achievements of games (Allison et al., 2006; Neys, Jansz, & Tan, 2014). Gaming disorder in late adolescence and young adulthood can enable the user to avoid the awkward and challenging interpersonal aspects of connecting with same-aged peers, including the emotional complexities of intimate relationships that they may fail to understand or increasingly perceive as threatening (Hawkins & Hertlein, 2013; Park, Han, Kim, Cheong, & Lee, 2016).

Gaming activities provide a safe "cocoon" for the user that fosters a new, more ideal identity that diverges from their non-gaming peers and is rooted within the values and expressions of the gaming world. The individual with IGD may create a physically strong virtual avatar if they feel weak in their real life, or develop mastery with a weakened (e.g., "under-leveled") character in a game as a subversive expression of strength.

Limited interactions with strangers in games may be considered "good enough," especially in comparison to the perceived risk of face-to-face contact and personal disclosure in real-world settings (Kaczmarek & Drążkowski, 2014). There may also be social cognition effects whereby clients are influenced by the views of their preferred game's online community, which may be overrepresented by problematic gamers, who promote and reinforce unhealthy gaming attitudes. Such views may undermine the client's exploration of alternative ways of viewing their gaming, and clinicians may need to identify and address this barrier in therapy.

Interpersonal functions of gaming

A gaming disorder can serve important interpersonal functions. These are particularly relevant to individuals who engage primarily in online and socially connected games, such as MMOs and other games with shared social experiences. Some of these interpersonal functions may be important to identify and address within therapeutic interventions.

Social distinction

An individual with IGD who has committed many thousands of hours to a game often believes that he is special or ranked favorably among other players. The player's in-game avatar may have visual attributes or cosmetic effects, or perhaps a designated number or rank, that signify the player's skill level and/or time investment in the game (Zhong & Yao, 2013). These features are likely to boost the player's self-esteem and/or

enable the player to have some actual or perceived privileges and access to gaming social circles and game activities (Barnett & Coulson, 2010; Smahel, Blinka, & Ledabyl, 2008).

Partners and parents of individuals with IGD may grow increasingly frustrated and angry as their attempts to establish rules and boundaries around gaming are resisted (Hertlein & Hawkins, 2012). Problematic gamers may become increasingly defensive and adamant about their desire to play games. Gaming thus becomes a means of keeping these concerned parties at a distance and avoiding direct discussion of the problem. Indeed, some problematic gamers may use gaming as a way of asserting a "silent control" in their relationship, as the act of gaming denies the gamer's partner of fulfilling a desire for interaction or time spent together on other activities. A person with IGD may interpret his partner's insistence for attention and joint non-gaming activities as a criticism of the gaming identity, rather than as a request or plea for greater intimacy and normal couple interaction. Over time, partners of individuals with IGD may learn that they cannot depend on the gamer for shared time and attention, and thus, seek social comfort and intimacy from others and/or nonhuman sources.

Safe communication

Individuals with IGD often become accustomed to and prefer the social communication style of online gaming (Young, 2009). The social requirements and demands of online games are much lower than other social situations. These interactions are generally more controllable in terms of pacing and content, meaning that individuals may be more able to present themselves in ways that are consistent with desired or ideal views of oneself. Some players may find it easier to be spontaneous or experiment with different ways of self-expression (e.g., making jokes, changing vocal qualities, or personal self-disclosure) that they would not usually attempt in face-to-face interactions. Players may be more likely to freely say aloud any ideas that come to mind, due to norms that allow conversational randomness, with almost no social repercussions or risk of straining social bonds when in the company of online strangers.

Online contexts also tend to lack the means to enforce immediate and/or meaningful sanctions for social transgressions, including verbal abuse and profanity (Suler, 2004). Social interactions in games can offer *safety* because they are typically anonymous and voice-only. Players may find safety in the choice to be silent or not socially interact at all. The limited social demands and lack of consequences in games represent safety and security.

Other maintenance factors

Gaming-related beliefs

These beliefs relate to thoughts about the functions of gaming activities. Given that individuals with IGD will often perceive there to be many positive functions of gaming, the thought of living without gaming is an unwelcome, if not unbearable, prospect.

In our qualitative study of 640 regular gamers, a common theme was the status of games as a "second life" for the player (King, Delfabbro, et al., 2017; King, Herd, & Delfabbro, 2017). As one participant in the study stated, "*I feel a stronger connection to the game than my life*." Many individuals with IGD may not perceive gaming as a problem, but rather as a lifestyle choice, with games as the main place that they feel competent, happy, or truly "alive." It may be useful to consider the individual's beliefs about gaming itself, including the perceived cost of ceasing or limiting their gaming. For some, particularly younger clients with limited insight into their gaming and themselves, it may require some work to identify or disclose these cognitions.

A client whose gaming serves a way to "achieve" and "feel special" may hold a belief, "*Without gaming I would be nothing, my life would be nothing but failure*" or "*I am only competent at playing games*." A person who depends on gaming to feel social recognition might report "*If I were to stop gaming, no one would like me*" or make similar negative social predictions. These types of beliefs are critical to the maintenance of IGD and ensure that individuals maintain a regular pattern of play. These beliefs also mean that the individual may feel very ambivalent about "overcoming addiction" or exploring alternative ways of viewing the consequences of their gaming behavior.

Withdrawal symptoms

Another important factor in maintaining a regular schedule of play is the negatively reinforcing effect associated with the relief of unpleasant mood states when gaming is resumed after a period of nonuse. This effect is likely to be heightened among individuals with IGD with a history of gaming for emotion regulation. Individuals predisposed to addictive behaviors are known to have an abnormal physiological resting state that leads to using substances or activities to maintain a desired mood state (Jacobs, 1986).

Studies of the effects of abstinence on the mood states of problematic gamers (Kaptsis, King, Delfabbro, & Gradisar, 2016) have found that problem gamers experience feelings of irritability, boredom, and heightened desire for mental stimulation when not playing games. Some report feeling "lost" and/or that life is "empty" or "lacking in purpose." Positive expectancy beliefs ("*I can count on feeling better if I play games*") and negative expectancies ("*I cannot cope with stress without gaming*" or "*I would be bored if I tried to do something instead of gaming*") may be activated in situations where gaming is not available.

Clinical case examples

Two case examples are provided to illustrate how the framework described in this chapter may be used to formulate individual cases. Such formulations are typically built up over the course of several sessions and may sometimes require the input from external sources, such as partners, parents, or teachers, in the case of adolescents. The formulation should be considered a "work in progress", *not* a definitive explanation. Therefore, it will be revisited and reviewed as new information and understanding comes to light in the course of therapy.

Early experiences and predisposing factors
• Social anxiety and tendency to interpret social situations as hostile • Mother tended to avoid displays of affection, used gifts • Divorce of parents and split of siblings • Gaming accessible in the bedroom at any time
Core beliefs
• I am weak, powerless, and incompetent • I am lazy and not good enough • I have no control over my life any more • I do not belong at school, others will judge and criticize me
Intermediate beliefs: Attitudes, rules, and assumptions
General: • If I leave the house and people see me, they will think I am weak and useless • I should keep my feelings to myself and my friends at a distance • The is no point in trying, because I am already a failure and lazy **Gaming specific:** • If I can master or excel in a game, then I am in control • Staying focused on gaming protects me from difficult social situations, or dealing with painful feelings and memories • Games create order and predictability in my world • I cannot control my gaming once I start playing
Triggers: Why gaming?
• Feeling stressed about school, I am expected to achieve, playing games helps to forget the real world and be told I am good by others, belonging to online groups
Function of gaming and my beliefs about it
• Safety, stay in the "bubble" of my bedroom • Control, games are predictable and familiar • Achievement, I am good at games, my online score proves I'm good • Avoidance, I do not have to think about anything, or feel bad about being a failure
Behaviors
• Stay in my room all day, do not eat, sleep when exhausted • Do not talk to anyone, do not face feelings • Play games and practicing to get better at them
Other factors that maintain my gaming
• Sleep all day, so I do not have to face others or the day • Eat less and have no energy to do things other than gaming • My rank in online games requires consistent playing to maintain it

Fig. 6.1 Shane's cognitive-behavioral formulation.

Shane: An adolescent client with IGD

Shane was a 16-year-old male with a 2-year history of intense online gaming. He was referred to a local adolescent mental health service by his mother following concerns expressed by his school Principal and teachers that he was no longer attending secondary school. His GP was also concerned by his low weight, lethargy, and poverty

Early experiences and predisposing factors
• Limited school achievement and work history • Few social supports, poor relationship with alcoholic father • Suicide of close friend • Break up with girlfriend due to gaming
Core beliefs
• I am weak, shameful, lack control • I am unlovable, useless and incapable, a failure • Other people do not understand me, reject me • The world is unpredictable, chaotic, bad things always happen
Intermediate beliefs: Attitudes, rules, and assumptions
General: • There is no point trying to make friends, as they will just reject you • Other people are usually stupid, wrong, or unkind • The world is unfair and designed to just make my life hard **Gaming specific:** • If I am good at a game, then I am in control • I have no control over my gaming • Gaming protects me from facing difficult and painful feelings • Games help me to escape from an unpredictable world
Triggers: Why gaming?
• Gaming is the only thing I am good at, gaming gives me power and an escape, I can be more comfortable when I am online or gaming
Function of gaming and my beliefs about it
• Escape, helps me to cope with my emotions • Control, games make sense to me • Achievement, I am special when I win a game • Vulnerability, I can be strong in a game
Behaviors
• Play games until I am physically exhausted • Argue with others about games to show my superiority • Plan and read about games online when I cannot play
Other factors that maintain my gaming
• I believe that gaming is the best way to cope with life's struggles • I am irritable and frustrated when not gaming • I tend to think that I should complete games once I start them

Fig. 6.2Chris's cognitive-behavioral formulation.

of speech. When Shane came to the first appointment, accompanied by his mother, he presented as plainly dressed and disheveled, shy and quiet, fatigued, and withdrawn. He had slept in until early afternoon and not eaten a full meal that day. He gave single-word responses or shrugged in response to questions about his referral and expressed that it was not his intention to come to the service. He displayed minimal affect and his body language conveyed low self-confidence.

Shane spent almost all available time playing an online game (*League of Legends*) on his personal computer located in his bedroom. His typical daily schedule involving gaming between the hours of 3 pm and 5 am. He preferred to play at night in order to play with others in a different time zone. His mother had requested the latest appointment of the day in order to accommodate his reverse sleep-wake cycle. He was left on his own in the house on most days of the week, while his mother and stepfather went to work. Shane ate only one or two meals per day, usually at his computer. Meals and snacks were sometimes left untouched by his computer and cleaned away by his mother. He reported his mood was "fine," but felt somewhat ashamed that he was not taking care of himself. Shane's mood was consistent with symptoms of a major depressive disorder, but he denied suicidal thoughts or intentions and had never made an attempt. He became agitated and averted gaze when discussing his personal hygiene and general health. His first priority each day was to log on to the online game that he played, and check his progress and standing in a few other games that he had played previously. He felt that once he started playing games, usually from the moment he got out of bed, it was not possible to stop. He did not exercise, socialize, and rarely left the house.

Shane lived with his mother and stepfather in a large, comfortable home. His mother owned a small business and was often busy at work, leaving early in the morning before Shane awoke. Shane was one of two siblings, with his older brother living with his biological father in another city, as an outcome of his parent's divorce a few years prior. Shane stated that his mother cared about him, but was frustrated with him, particularly because he was no longer attending school. She implored Shane to be a "good boy" and return to school, but he ignored her, seemingly from a position of helplessness and apathy rather than defiance. He denied that he fought with his mother, but acknowledged that she was often upset with him. Their interactions were otherwise mostly superficial and regressive and they avoided talk of Shane's emotional state. His mother tended to show affection through gifts or treats, which were sometimes intended as bribes for him to stop gaming. His stepfather was more critical and authoritarian toward him, but he was also less involved and therefore did not outwardly show much interest in Shane. Shane described feelings of guilt about his gaming and felt that he was a failure and a constant disappointment in the eyes of his mother and his wider family.

Shane had played games for most of his life, but his gaming had intensified following the divorce and his transition into high school, which he reported to be stressful for social reasons. He felt that it was hard to make friends because he was shy. He was academically bright and had attained A-grades in Maths and Science before he stopped attending school. According to his teachers, he was accepted among his classmates without being "popular" and had received cards and letters encouraging him to return to school, but Shane disregarded these as "fake" and felt he had no real friends. He mentioned that he had once liked a girl at school, but felt that she was not interested in him. This was part of a pattern of difficulties in expressing himself to others and his tendency to interpret neutral social interactions as threatening. The prospect of returning to school was stressful for him and elicited anxiety that he would be judged negatively and talked about by everyone at his school. He was not interested in pursuing further schooling and was not able to articulate any other plans or ambitions for the future.

Shane reported that, as he had increased his gaming, he had become quite proficient at several competitive online games. His online achievements were an apparent source of pride to him, but he showed some mixed feelings, such as shrugging in response to questions about how important his gaming was compared to other things he had done. He stated that he had been in the top 100 leaderboard of players in Australia in one such game, but felt conflicted about the value of this achievement when asked directly. He mentioned that his rank has now likely been "reset" (i.e., deleted). He tended to minimize his real-life achievements, including his academic achievements that included prizes in national Maths competitions, saying it was not really his choice to enter them and that they were meaningless to him. He explained that he did not really try at most things in his life because he was "lazy."

Shane attended the mental health service on two further occasions, but he missed most of his scheduled appointments due to his tendency to sleep during the day. Some attempts to understand the meaning of his gaming were made, but this was difficult given Shane's lack of insight, withdrawn and lethargic state, and Shane's mother's lack of commitment to introduce a new routine for his diet and sleep. It became clear that his family was enabling his gaming to some extent and often made compromises that led to Shane missing appointments. Shane and his mother did not comply with a behavioral activation plan to go into the backyard at the start of each day to feed the family's pet birds. It was recommended that the family introduce limits on Shane's access to games and set boundaries around gaming such as when he could play, but these recommendations were not implemented. A cognitive-behavioral formulation of his gaming disorder was developed slowly over time, using Shane's own words as much as possible, as well as some information from other sources. The formulation emphasized the links between his experiences and beliefs and the functions and maintenance mechanisms relevant to his gaming. This formulation is presented in Fig. 6.1.

Chris: An adult client with IGD

Chris was a 32-year-old man with a 12-year history of IGD. He was referred by his GP for psychological evaluation of his depressed mood and suicidal ideation. Chris presented with low mood at his first appointment and said that he agreed to the referral because he felt that his gaming was making him unhappy and had reached a point that he wanted to address it. Chris did not use any psychoactive substances, except for sugary caffeinated beverages. He reported poor sleep and did not exercise. He was overweight, poorly dressed, and disheveled. He explained that he wanted to completely stop gaming for as long as possible, and then resume gaming in a controlled way, in moderation with other activities. He said that he felt worried about this change and that his life might be meaningless without video games.

Chris estimated that he played games, on average, between 8 and 14 h per day, which was a habit maintained with almost no interruption for many years. He stated that it was a "steady habit" that he had organized his life around as much as possible. His gaming had commenced in his teenage years and became increasingly more frequent after graduating from school. His most significant employment in early adulthood was

a part-time game-testing job, which he considered a "great opportunity" because he could be paid for doing something that he was "actually good at". He felt that he was not overly capable at most tasks and that gaming was his "true passion." Chris had very few friends or supports, including a distant relationship with his mother and an estranged relationship with his father who was an alcoholic. His most significant interpersonal relationship was a close friend he had known since attending school, who later became a game-tester. Chris had always played games with this friends and they had shared a similar sense of humor and outlook on life. This friend committed suicide when Chris was 21 years old. The suicide had affected him greatly, particularly as he had envisioned this friend as being a major part of his future life plans.

Chris was a below average student in school, but he was unable to reach his potential due to absence caused by family instability. His lack of school connection and success was associated with limited notions of future career options. After school, Chris pursued employment related to gaming, such as work in electronics and gaming stores, and then found some casual opportunities in the gaming industry through friends. After his friend's suicide, he become depressed and was fired from a series of jobs for regularly failing to show without cause. He attributed his lack of routine and avoidance to difficulties in adjustment to the death of his friend because gaming jobs served as frequent reminders of his friend. He was also playing games much more intensely during this time. In his mid-20s, he moved into a shared apartment, where he spent most of his time gaming. Gaming reportedly provided Chris a safe place to forget about his problems. He was aware that his real-world friends were annoyed by his gaming, so he tried to hide the extent of his gaming. He tended to enter the shared area of the apartment when he was certain that others were away or asleep. Sometimes he would urinate in bottles in his room to avoid contact with his cohabitants. Chris was unemployed for several months and was eventually asked to leave the apartment for failing to contribute financially or perform housekeeping. He acknowledged that it was "mostly" his fault that this had occurred, but felt resentment about the situation and had ended these friendships. He said he felt accustomed to relationships drifting away without resolution.

Chris later found a new job and a girlfriend, which he described as one of the "high points" of his 20s, mainly because he felt like he had more stability in his life which he felt had always been lacking. The relationship was short-lived, however, due to his negative attitude and his tendency to become bored doing non-gaming activities. He said he often sabotaged the relationship by gaming and became irritable at his girlfriend for suggesting non-gaming activities. He recalled going on an international holiday together and spending most of the trip in the hotel playing games while she went sightseeing. The relationship ended when they returned home, and Chris fell into another depression. He coped with the dissolution of the relationship by playing online games and consoled himself that gaming was all he needed to be happy. Over the next few years, Chris struggled to find stable employment, and he became more isolated from his limited network of friends. His social interactions tended to revolve around discussion of gaming, television, or movies, and he often became quite critical and argumentative. He belittled friends whose opinions differed from his own and was often unaware of how his actions alienated him from others. He felt that he alternated between feelings of frustration and detachment with most people in his life.

Chris reported that it was hard to imagine his life without games. Many of the memories in his life were organized or catalogued according to years of game releases and gaming experiences. He showed an expansive knowledge of games, particularly in relation to game features such as graphics and sound, difficulty, endgame rewards, and the amount of time he had invested in them. He pointed to some specific games as influential in helping him to escape from painful life events. He had gravitated in particular to large, open-ended games with exploration aspects where he felt he was regularly able to lose track of time and assume a new identity. Chris referred to such experiences as familiar and comforting, which helped him to escape reality. He reported feeling "lost" when he eventually finished these games and desired another game to fill the void. He often read gaming news websites to track and anticipate the release of new games and he made sure that he had a constant catalogue of new games to play. He spent almost all of his disposable income on gaming software to amass a collection, but admitted he had not played many of the games he had purchased.

Before entering therapy, Chris had made some efforts to tidy areas of his house and pack away his gaming computer into storage so that it would be less available to use. He had phoned a friend to talk about his problems and had made a plan to stay or visit with that friend on a weekly basis. He expressed a desire to make sense of how his life difficulties had contributed to his dependence on gaming, particularly his friend's suicide which he felt he had never truly confronted and recovered from. He and his psychologist developed a cognitive-behavioral formulation that is presented in Fig. 6.2.

Summary: Framing the gaming

Case formulation is a necessary and useful process for guiding the intervention from a person-centered approach. This chapter has attempted to outline a framework for the cognitive-behavioral formulation of individuals who present with IGD. Clinicians and researchers should apply these ideas flexibly and adapt them to individual clients. An important aspect of this approach is to consider the importance of gaming and its functions in its broader context. Although the client's perceptions of gaming rewards, achievements, and identities are usually relevant to some degree, many other issues and background factors are significant in understanding the nature of the gaming disorder. Additionally, the clinician should be mindful of his or her own views or attitudes about gaming (e.g., acceptance vs disapproval) which may influence how the formulation develops and which elements are considered salient to understanding the problem. Openness to the client's gaming experiences and their personal meaning is an essential part of building the formulation.

Clients with long-term IGD, including adolescents who have spent 12 months or longer doing very little other than play games, will often present in therapy with a paucity of personal non-gaming information to disclose. It may be a struggle to engage with such clients, due to their lack of attachment to real-world people and events. Such clients may appear bland or inconsiderate, and lacking in reactivity to even serious life events, such as illness, family divorce, or loss of friendships, and thus, the true significance of these events may be only guessed at by a clinician. It may be tempting for the clinician

to wish to initially direct the client to discussion of non-gaming domains, such as their previous experiences, family relationships, and real-world life ambitions, to try to understand, relate to, or establish rapport with the client. Some clients with IGD, particularly adolescents, may resist this direction because they feel incapable of talking about issues unrelated to gaming. It may be helpful in these cases to roll with the client's indifference or resistance, explore others' perspectives, and focus on establishing rapport. Discussing how the client feels to be in a therapy session and not playing games as they usually would be at that moment may potentially elicit useful information.

Working on a shared diagrammatical formulation of the client's "gaming persona" and then moving outwardly into their real-world life may be an effective way of capturing the issues and problems that have preceded and cooccurred with IGD. In discussing video games, it is important to maintain the focus on the client's personal experience and perceptions of games they play, avoiding the pitfall of shifting to broad talk on gaming in general. The client may feel more comfortable in discussing the potential differences in their online and offline identities once they feel that the clinician has heard and understood their gaming.

Another approach may be to write a formulation letter that attempts to link the client's own words and expressions to the narrative of their gaming in the context of other events. This may be accompanied by a basic timeline of life events or similar formulation. Although this timeline may be lacking in some ways, it may be validating for the client, particularly for adolescent clients with limited meaningful social contacts or those accustomed to experiencing disapproval or conflict in most relationships.

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Treatment for IGD

7

Chapter Outline

Introduction and overview

Internet gaming disorder (IGD) is a complex phenomenon with several characteristics that demand attention in treatment. In basic terms, IGD is characterized by persistent gaming that results in impaired psychosocial functioning. While researchers debate the validity of some IGD criteria, such as tolerance and withdrawal symptoms

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(Billieux et al., 2017; Starcevic, 2017), treatment approaches to IGD have generally been adapted from addiction treatments.

Many approaches view individuals with IGD as having *cognitive biases* that arise in and relate to gaming activities and *impaired control* over motivational drives for reward-seeking (Dong & Potenza, 2014). Accordingly, two crucial components of effective treatment for IGD are thought to include strategies that: (i) modify clients' maladaptive beliefs about gaming behavior and (ii) help reduce withdrawal and other unpleasant mood states when not gaming. The ultimate aim of treatment is to reduce or eliminate gaming behaviors that interfere with self-care, relationships, and other life responsibilities.

The administration of treatment for IGD, however, is much easier said than done. Allison, von Wahlde, Shockley, and Gabbard (2006) expressed lament that clinicians, including experienced, multidisciplinary teams, often felt poorly equipped to respond to individuals with severe gaming-related problems. Since this report, clinicians have continued to be challenged by clients with IGD, many of whom may hold certain views about gaming activities that are not dissimilar to spiritual devotion. These clients may even deny gaming has any negative consequences, despite objective evidence to the contrary, and express a strong desire to leave therapy and continue gaming. Gaming behavior may regularly occur for more than 100 h per week in the context of IGD. Therefore, if gaming is reduced, then something else must fill the void.

Another challenge in this area is the lack of practical resources, including structured, step-by-step treatment manuals, or comprehensive descriptions of the procedures and techniques employed in IGD treatment studies (King et al., 2017). Some peer-reviewed articles on treatment fail to describe even the basics of what might be involved in treatment. Therefore, many practitioners working with clients with IGD are often confronted with the dilemma that the evidence base appears incomplete and that treatment guidelines have not yet been developed (King & Delfabbro, 2014). The aim of this chapter is to introduce some of the main treatment approaches to IGD, with an emphasis on cognitive-behavioral approaches.

This chapter will begin with a critical overview of the international evidence on treatment of IGD and some of the ways in which treatment evidence can be improved. We will then highlight some of the practical challenges involved in working with clients with IGD. Some practical approaches to excessive gaming are described, noting that these strategies may be particularly helpful in the early stages of treatment. Some of the basic pillars of cognitive-behavioral therapy for IGD are described: psychoeducation, behavioral modification, cognitive therapy, and relapse prevention. Finally, this chapter will summarize some key issues related to family therapy and residential approaches to IGD.

The big picture on treatment evidence

In late 2016, we conducted a systematic review that aimed to gather all available peer-reviewed IGD treatment studies published in the past decade (King et al., 2017). This international review collected treatment study data from both Western and Eastern regions, to assess its overall reporting quality. Study reporting quality was determined by the degree to which each study adhered to the Consolidating

Standards of Reporting Trials (CONSORT) statement (Boutron, Altman, Schulz, & Ravaud, 2008), i.e., the "gold standard" for clinical research.

The review included studies that reported on a treatment for "Internet gaming disorder" or "gaming disorder" (i.e., the current draft classifications in the DSM-5 and ICD-11 systems), as well as treatment for "Internet addiction" where the most common use of the Internet was gaming-related. The review did not include case reports, or interventions that targeted non-gaming-related issues, and studies without outcome data. With the assistance of an international team, the review identified and included studies published in Korean, Chinese, Japanese, and German. Table 7.1 presents a summary of all 30 reviewed studies.

The review found that 70% of the evidence base on IGD treatment was conducted by teams in South Korea and China. IGD treatment in Western populations was very underrepresented, with only a few studies conducted within the United States, and no studies in the United Kingdom or Australia. Irrespective of region, most treatment studies have tended to have a critical design weakness: the lack of follow-up measures. This has meant that there is often no way of telling whether the treatment produced any longer-term gains. Studies were primarily pretest/posttest designs and also lacked randomization or blinding techniques. Further, one-third of the studies did not employ a comparator for between-group comparison; most studies did not provide adequate justification for their sample size; and there were multiple inconsistencies in assessment of treatment outcome (e.g., varying measurement of IGD symptoms, diagnostic status, comorbidity, or time spent gaming across study phases).

Knowing how individuals with IGD are changing over the course of treatment is crucial to evaluating the strengths of an intervention, but this information was generally limited to reports of how much time was spent gaming or the mean number of IGD symptoms endorsed by participants. It was, therefore, difficult to tell from most IGD treatment studies whether people were "getting better" or had recovered, that is, in terms of a meaningful change to their IGD diagnostic status maintained for a considerable amount of time.

The IGD treatment evidence base has steadily grown. Unfortunately, however, the rate at which randomized controlled trials (RCTs) for IGD are being conducted does not appear to have increased much over time, nor has there been a greater adherence to the CONSORT statement in the design of new studies. The total number of scholarly papers on IGD has grown almost exponentially over time (Billieux, Schimmenti, Khazaal, Maurage, & Heeren, 2015), but the treatment literature has seen relatively little growth. This disparity probably reflects the relative ease with which established scholars and newcomers to the field have been able to generate many nonempirical research outputs (i.e., reviews, commentaries, debate papers, and letters) on IGD and related topics, as compared to the more laborious and resource-demanding tasks of carrying out and publishing RCTs or other types of treatment studies (e.g., case studies). The IGD literature is a veritable forest of opinion and debate papers sprung from the seeds of a handful of empirical studies.

The majority of IGD treatment studies (80%) have utilized diverse psychological or counseling interventions, with several studies also including a pharmacological

Table 7.1 **An overview of 30 treatment studies for IGD published 2007–2017**

Study	Assessment of Internet addiction or related disorder	Excluded morbidity	Interventions	*N*	Age range (years)	Outcome measures	Follow-up	Country
1. Cao, Su, and Gao (2007)	YDQ (score 5+)	NR	1. Group CBT (8 modules) 2. NT control	64	12–18	YDQ; CIAS; SDQ; SCARED	Posttest	CH
2. Wu, Yan, and Han (2007)	YDQ (score 5+)	NR	1. Transcutaneous electrical stimulation (HANS) 2. Placebo HANS treatment	27	16–27	Self-devised IA scale; Internet use	Posttest, 3-day follow-up	CH
3. Young (2007)	IAT (score not specified)	History of psychological trauma, sexual abuse, or Axis II pathology	1. CBT (12 sessions)	114	NR	COQ (self-devised)	Posttest; 6-month follow-up	USA
4. Dell'Osso et al. (2008)	IC-IUD-YBOCS (4 criteria)	Comorbid organic or psychotic mental disorders, mental retardation, substance use or dependence, personality disorders, SI	1. Escitalopram 10–20 mg (10-weeks) and placebo 2. Escitalopram 10–20 mg (19-weeks)	14	18–51+	CGI-I; BIS; YBOCS;IC-IUD-YBOCS; Internet use	Posttest	USA

5. Kim (2008)	K-IAS (score not specified)	NR	1. R/T group (5 weeks) 2. NT control	25	NR	K-IAS; CSEI	Posttest	SK
6. Lee and Son (2008)	IGAT (translated IAT) (score 70+)	NR	1. Group CBT (12 modules) 2. Sport program	27	NR	IGAT; BDI; SCRS	Posttest; 8-week follow-up	SK
7. Han et al. (2009)	YIAS-K (50+)	Prior history of psychiatric treatment; IQ < 70; substance use; mood/anxiety disorders; developmental disorders	1. Methylphenidate (8 weeks)	62	8–12	YIAS-K, K-ARS-PT; VCPT; Internet use	Posttest	SK
8. Shek, Tang, and Lo (2009)	YIAS-10 score of 4; YIAS-8 score of 5; YIAS-7 score of 3; CIAS score of 3	NR	1. Multi-modal counseling (15–19 months)	59	11–18	YIAS-10;YIAS-8;YIAS-7; CIAS; BDI	Posttest	HK
9. Du, Jiang, and Vance (2010)	Beard's Diagnostic Questionnaire	Preexisting psychiatric disorder; comorbid medical disorder; currently taking psychoactive medication	1. CBT (8 sessions) 2. NT control	56	12–17	IOSRS, SDQ, SCARED; Internet use	Posttest; 6 month follow-up	CH

Continued

Table 7.1 Continued

Study	Assessment of Internet addiction or related disorder	Excluded morbidity	Interventions	*N*	Age range (years)	Outcome measures	Follow-up	Country
10. Han, Hwang, and Renshaw (2010)	YIAS score of 50 or higher; > 4 h per day/30 h per week; DSM-IV criteria for substance abuse	History or current episode of Axis I psychiatric disorder; substance abuse not including tobacco and alcohol; neurological or medical disorders	1. Bupropion (6 weeks, 15–300 mg) 2. Case-control	19	16–29	YIAS; fMRI (brain activity); Internet use	Posttest	SK
11. Jing, Weiping, and Yong (2010)	YDQ (score 5+)	Severe depression	1. Group CBT (8 sessions) 2. NT control	81	NR	CIAS; ESLI; SES; Coping scale	Posttest	CH
12. Ge et al. (2011)	YDQ (score 5+); SCID	Pregnancy; medical conditions; SI; psychosis; mania; substance use or dependence	1. Group CBT (3 months) 2. Case-control	96	28–35	P300 waveform	Posttest	CH

13. Su, Fang, Miller, and Wang (2011)	YDQ (score 5+); Internet use of 14 h or more per week	Currently taking psychotropic medicine or receiving other treatment for Internet addiction	1. HOSC-NE (one session) 2. HOSC-LE (one session) 3. HOSC-NI (one session) 4. NT control	65	NR	YDQ; Internet use	1-month follow-up only	CH
14. Han and Renshaw (2012)	YIAS (score 50+); gaming 30 h per week; impaired control and distress	NR	1. Bupropion (150–300 mg) + Education (8 weeks) 2. Placebo + Education	50	13–45	YIAS; BDI; CGI-S; Internet video game use	Posttest; 4-week follow-up	SK
15. Kim, Han, Lee, and Renshaw (2012)	YIAS (score 50+); gaming 30 h per week; impaired control and distress	History of psychiatric disorders; substance abuse history; neurological or medical disorders	1. CBT (8 sessions) + Bupropion (150–300 mg) 2. Bupropion (150–300 mg)	65	13–18	YIAS; BAI: BDI; M-SPBS; total time of Internet game play	Posttest; 4-week follow-up	SK
16. Jeong (2012)	K-IAS (score 94+)	NR	1. Group counseling (6 sessions) 2. NT control	21	11	K-IAS; C-DBS; SIS; SES	Posttest; 2-month follow-up	SK

Continued

Table 7.1 **Continued**

Study	Assessment of Internet addiction or related disorder	Excluded morbidity	Interventions	*N*	Age range (years)	Outcome measures	Follow-up	Country
17. Zhu et al. (2012)	Criteria from American Association of Psychology (1997)	Non-IA mental disorder; cardiovascular disease; pregnancy; hypersensitivity to acupuncture	1. Electroacupuncture 2. Psychointervention 3. Both	120	18–24	YIAS; P300 Waveform; WMS	Posttest	CH
18. Lee, Jung, Kim, and Seo (2013)	IUHDS	NR	1. Group counseling (6 sessions) 2. Control	46	NR	IUHDS; Internet use	Posttest	SK
19. Li and Wang (2013)	OGCAS (score 35+); IAS-CR (3+); gaming 30 h per week	ADD; major depression; anxiety; Schizophrenia	1. Group CBT (6 weeks) 2. NT control	28	12–19	IAS; OGCAS; cognition scale	Posttest	CH
20. Thorens et al. (2014)	IAT (score 70+)	NR	1. Psychotherapy	57	13–67	IAT; CGI	Posttest	SW
21. Young (2013)	IAT (score 4+)	Trauma history; personality disorders	1. CBT (12 weeks)	128	22–56	IAT; COQ	Posttest; 1-month; 3-month; 6-month follow-up	US

22. Wartberg, Thomsen, Moll, and Thomasius (2014)	CIUS	None	1. Group CBT (8 modules)	18	12–17	CIUS; RAAI; Internet use	Posttest	DE
23. Wölfling, Beutel, Dreier, and Müller (2014)	AICA-S (score 7+)	Comorbid disorders; severe IA	1. CBT (24 sessions)	42	18–47	AICA-S; SCL-90R; GSE; Internet use	Posttest	DE
24. Bipeta, Yerramilli, Karredla, and Gopinath (2015)	YDQ (score 5+)	Psychiatric disorders; BIS (55+); substance dependence history; personality disorder	1. Various pharm	72	25–30	IAT; YBOCS; BIS	12-month follow-up only	IN
25. Liu et al. (2015)	APIUS (score 3.15+)	Physical disabilities; other addictive behaviors; other mental disorders	1. MFGT (6 sessions) 2. Waitlist control	96	12–18	APIUS; P-CCS; Internet use	Posttest; 3-month follow-up	CH
26. Shin, Ryan, Kim, Lee, and Chung (2015)	KIAS	NR	1. MI group (6 sessions) 2. Waitlist control	20	NR	KIAS; SOCRATES-I; Internet use	Posttest	SK

Continued

Table 7.1 **Continued**

Study	Assessment of Internet addiction or related disorder	Excluded morbidity	Interventions	*N*	Age range (years)	Outcome measures	Follow-up	Country
27. Lee, Seo, and Choi (2016)	KSAPS	NR	1. HDJ-S (2 weeks)	335	12–14	KSAPS; parental concern; motivation	Posttest	SK
28. Park et al. (2016)	YIAS (score 50+); Internet use > 30 h	Axis I disorders; alcohol and other substance dependence; history of head trauma or other neurologic disease	1. CBT (4 weeks) 2. VRT (4 weeks) 3. NT control	24	18	YIAS; BDI; BAI; ASRS-K; fMRI assessment	Posttest	SK
29. Santos et al. (2016)	IAT (Score 50+)	Illiterate; Axis II disorders	1. CBT + pharm (10 weeks)	39	18–65	YIAS; CGI; depression/ anxiety	Posttest	BR
30. Sakuma et al. (2017)	DSM-5 criteria	NR	1. SDiC (CBT, counseling, medical lecture, outdoor program) (9 days)	10	15–17	SOCRATES; self-efficacy; Internet use	Posttest; 3-month follow-up	JP

or electroacupuncture treatment (King et al., 2017). Interventions have included cognitive-behavioral therapy (CBT), motivational interviewing (MI), reality training, or a combination of psychological and/or counseling therapies within a broader treatment program. Studies have used a mix of individual and group approaches. Drug studies have been much less common, usually involving samples with comorbid conditions (e.g., attention deficit disorder), and almost exclusively carried out in East Asian countries. Bupropion (dose: 150–300 mg) has been the most commonly studied and empirically supported choice of medication. No drug has yet been investigated in at least two independent double-blind studies, so it may be premature to recommend medication for IGD at this stage.

Based on these review findings, practitioners continue to face a major dilemma in terms of IGD treatment: should they consult the limited base of mostly non-RCT studies that have limited follow-up for possible guidance? Or should they look outside the IGD field to consider the treatments prescribed for other addictive or compulsive behaviors, such as gambling disorder, obsessive-compulsive disorder, substance use disorders, or impulse control disorders?

Drugs or therapy: Which is more effective?

Therapy-based studies for IGD outnumber pharmacological treatment studies by a factor of about 3 to 1. This raises the question: are therapy approaches, such as cognitive-behavioral therapy (CBT), more effective than medication? The most recent meta-analysis to address this question was conducted by Winkler, Dörsing, Rief, Shen, and Glombiewski (2013), who assessed 16 studies of psychological and pharmacological treatment studies of Internet addiction (IA) conducted worldwide, which included but was not limited to gaming-related problems. Although Winkler et al.'s analysis did not include more recent studies (e.g., those included in King et al., 2017), it did include many of the major medication-based studies and the RCTs conducted in 2009–2012.

Winkler et al.'s comparison of psychological and pharmacological interventions reported that there were no significant differences in their efficacy for improving IA or reducing time spent online. However, psychological treatments for IA were reported to be more effective for reducing comorbid depression. CBT was reported to be the superior psychological treatment for reducing time spent online and depression, but CBT did not differ from other approaches in terms of reducing IA symptoms. Although Winkler et al. reported that treatment effect size estimates were "high, robust, unrelated to study quality or design, and maintained over follow-up" (p. 317), it is important to remember that the studies rarely administered follow-up measures. Overall, no single treatment appears to have a clear advantage over others, but CBT might be the first choice among practitioners who must decide among available options.

How can the evidence base be improved?

The 2017 review proposed several ways in which studies of IGD treatment could be improved in the future. It would be unreasonable (and counterproductive) to expect that all studies be conducted as rigorously as a RCT, but many of the reviewed

studies would have been improved by some simple improvements in the way that findings were reported. For example, many studies could have provided more precise statements of treatment effects (e.g., estimates of effect size and confidence intervals).

Another improvement would be providing better descriptions of the actual interventions or treatment techniques used (e.g., exposure therapy, psychoeducation, and cognitive restructuring). Studies employing CBT, for example, often do not describe the target beliefs being modified in therapy, or they might state that a technique was used with very little additional information about its implementation. Given the space restrictions of peer-reviewed articles, one way of providing more detailed procedures or explanation of therapeutic techniques could be as online supplementary material. The field currently lacks published manuals on IGD treatment, so this type of information is needed and would be a valuable resource for clinical practice and future reviews. Other improvements include stating the level of participant adherence (e.g., number who attended, completed homework, etc.) and the qualifications and experience of those administering treatment.

Many IGD treatment studies have fundamental design flaws. These could be improved by: (1) extending follow-up assessment from 1 month to at least 3–6 months; (2) including an assessment of diagnostic (i.e., clinical) change, rather than differences in mean symptom score; (3) conducting a broader assessment of treatment outcomes, including quality of life, and measuring cognitions in CBT studies (see King & Delfabbro, 2014); and (4) examining posttreatment adjustment, including social and environmental changes. Clinical trials should be registered to define outcome measures a priori and reduce potential outcome reporting biases.

Once the IGD evidence base becomes more established, it may be useful to include populations with comorbidities and trial treatments that target comorbidities in conjunction with gaming problems. Individuals with IGD have a strong online presence, yet online treatments are relatively understudied compared to other modes of delivery. Online treatment might be considered counterproductive to the goal of reducing Internet use, but online services are already prevalent and may be the first avenue for many help-seekers, particularly in Western countries where other services may not be available.

Treatment aims: Taking control of the game?

As noted in Chapter 5, the goal intentions of the client have significant bearing on the course and likelihood of success of the treatment. Some individuals with IGD are simply not willing or equipped to make changes of any kind to their gaming. For example, a 29-year-old male with IGD reported in one of our studies (King, Adair, Saunders, & Delfabbro, 2018) that he felt "incredibly bored and lost" without games, stating: "*I engage in gaming due to its challenging nature. I found it harder to keep my mind engaged during down time. My other pastimes are not as mentally challenging compared to the complexity of most of the games I choose to play*". At the same time, the desire to change does not by itself guarantee that any gains will occur.

For many seeking help for problematic gaming or IGD, the ultimate goal may not be to "quit" gaming, but rather to maintain a gaming schedule that is compatible with life responsibilities. Many of the very limited public health resources on prevention of gaming-related harms have been developed from the perspective that gaming in moderation may be the most realistic and achievable outcome (e.g., McLean, 2013).

In a 2014 review of treatment studies that employed follow-up measures, all eight studies reported that participants' long-term aim was controlled use of games rather than abstinence (King & Delfabbro, 2014). Interestingly, studies have tended to infer successful controlled use based on participants' self-reported changes in gaming time and IGD symptoms, rather than employing an assessment of any specific thoughts or behaviors that might indicate the individual was "in control" of gaming (i.e., volitional gaming behavior). Future studies might wish to consider what *controlled* gaming looks like in practice.

It is likely that "controlled use" of games will differ depending on the client. Just as people differ in their dietary needs for health reasons, a pattern of gaming behavior that is adaptive for one person may be risky or potentially destructive for another. To define "controlled use," one approach might be to specify an amount of time that seems reasonable and accommodating of other life responsibilities. This might be a very effective strategy for some individuals, under the right conditions. However, some may find it difficult to adhere to a strict gaming time limit due to losing track of time when playing (or failing to set a timer). Time limits may also be undermined by client self-talk, such as minimization (e.g., "*a few more minutes won't hurt*") or bargaining (e.g., "*If I play more now, then I won't play tomorrow*").

Gaming activities tend to have a variable time requirement for completion, depending on the player's performance, uncontrollable events, or the actions of other players. Therefore, the player may need to have the foresight and self-control not to begin a new gaming activity that requires more time to complete than allowed by the time limit. Simply put, a basic time limit approach to controlled use may not be practical and set up some clients to fail. It may be analogous to dieting using a "counting calories" approach without having other supporting strategies or accounting for the type of food being consumed. An alternative approach may be to develop a gaming schedule that reinforces the individual for taking "gaming-free" days. Another option is to identify specific games and social conditions that make gaming more "fun" and "social" and less of a socially isolating or work-like commitment.

Individuals with IGD may express their hopes for therapy in terms that appear unrelated to gaming. Some of the motivations for seeking help stated by participants in a study of the effects of gaming abstinence included: "*finding more happiness*", "*taking control of my life*," and "*fix my relationship with my wife*" (King et al., 2018). The client's reasons for entering treatment may sometimes indicate denial or lack of acceptance that gaming is a problem or a distorted view that gaming is merely the "temporary solution" to other problems. A treatment goal such as "*find more happiness*" might be reported by a client who feels some ambivalence toward gaming. He may benefit from learning new skills and/or engaging in new experiences to reduce his reliance on gaming activities.

However, good therapy cannot aim simply to subtract as much gaming as possible from the client's life without also helping the client to problem-solve and find ways to pass time and meet psychological needs with new activities. Many clients report that they devote almost all waking hours to gaming. A plan to decrease gaming requires the anticipation of, and planning for, the client's needs for mental stimulation (e.g., skills, activities) and social connections to fill the "gaming-sized void" in the client's life (King, Kaptsis, Delfabbro, & Gradisar, 2016). This may involve helping the IGD client manage feelings (e.g., dysphoria, boredom) and accept that non-gaming activities may initially be not enjoyable or seem less rewarding than gaming. The client may require guidance to notice and reflect on the gains made in life areas that might be ignored, downplayed, or criticized in comparison to gaming.

Barriers to change

Therapy and other interventions (e.g., harm reduction strategies, see Chapter 8) for IGD will encounter many of the same obstacles to success as those faced by other mental disorders. The most common challenges relate to the level of motivation and engagement by the client (which is typically low in adolescent clients); the skill and experience of the practitioner; the strength of the therapeutic alliance; and the availability and quality of other support (e.g., family, friends, allied services). Gaming is an extremely popular activity around the globe and this is not likely to ever change. The "normalization" of gaming means that it will be challenging to achieve distance from the social and environmental cues to play games.

Making some practical changes in the home environment may be the most logical place to start (King, Delfabbro, Griffiths, & Gradisar, 2012; Young, 2009). Individuals with IGD will have personalized their main living areas to centralize and support gaming, such as having all furniture positioned and orientated to face the television and gaming devices, blackout blinds to darken gaming areas, and the display of gaming-related paraphernalia. These environmental features serve the purpose of making gaming activities more accessible, immersive, and enmeshed with the real world. Modifying these areas may help to reduce their influence on the initiation and maintenance of gaming.

Another important barrier that has received relatively little attention in the IGD treatment literature is comorbidity. A large proportion (57%) of the 30 treatment studies that we reviewed (King et al., 2017) have excluded potential participants if they reported significant comorbid symptomatology, including the presence of concurrent mood disorders and substance use or dependence. While this exclusion approach is understandable for isolating the effect of the trialed therapy on IGD, it may give an impression to the undiscerning eye that these treatments are effective for IGD across a diverse range of cases.

Research has shown that IGD and gaming-related problems are likely to cooccur with many other mental health issues. For example, a study by Hyun et al. (2015) of 263 patients with IGD found that depression and attention deficit disorder were the strongest factors associated with the development of IGD. Similarly, a study by

Frölich et al. (2016) found that gaming problems were commonly associated with conduct and emotional problems in a sample of 183 adolescent psychiatric patients. Therefore, cases of "pure IGD" may be relatively rare, particularly in young adults, a population at-risk of other psychological conditions.

Individuals with IGD combined with another disorder are also known to be more difficult to treat. For example, in our study of 186 help-seeking problematic gamers (King et al., 2018), it was found that those individuals who reported depression and anxiety (40% of the sample) had significantly more IGD symptoms, stronger ratings of dysfunctional gaming-related beliefs, more previous episodes of gaming problems, and poorer overall quality of life. Therefore, available studies on IGD treatment that have included IGD-only cases may not generalize in terms of treatment success to more complex presenting cases.

Comorbidity has a major impact on treatment decisions. Clinicians managing IGD clients combined with significant medical and/or psychological problems may feel uncertain of where treatment should begin. In some cases, practitioners may feel that addressing gaming behavior is not a priority, particularly so when confronted with other serious risk considerations (e.g., suicidality). Excessive gaming behavior could even be viewed as a "protective" factor or the main thing that keeps the individual occupied, comfortable, or sane.

Assuming that gaming is somehow helpful, however, may be misguided in some cases. In addition to the negative affect or distress created or exacerbated by IGD symptoms, gaming may be a component of an avoidant behavioral pattern that becomes increasingly entrenched, thereby stalling or preventing recovery or improvements in functioning (e.g., independent living, schooling, meeting people, leaving the house, learning to drive). Heavy gamers may be more likely to delay or fail to attend appointments for medical or psychological issues. The case formulation should identify the links between IGD and other mental health issues to develop a comprehensive treatment plan. In some cases, the coordinated involvement of other specialist services and/or practitioners may be required to manage these issues.

Another significant challenge for treatment is maintaining client engagement, particularly in the case of adolescent clients who deny that gaming is a problem and refuse to attend therapy. While some treatment studies have reported that participant dropout or attrition tends to be quite low (see Winkler et al., 2013), this observed adherence to treatment may occur because studies tend to eliminate participants who are unlikely to engage prior to the main trial phase. For example, studies often exclude complex cases or impose administrative requirements that may exclude less organized individuals and families. A structured study protocol of six sessions in weekly succession may also be easier for clients to attend than appointments at irregular times and intervals.

Many treatment studies may not reflect certain realities of clinical practice. For example, the National Hospital Organization Kurihama Medical and Addiction Center, in Yokosuka, Japan, opened a specialist clinic for the treatment of Internet-related disorders in Japan, in 2011 (Higuchi et al., 2017). The center reported that it accepted 252 new referrals in 2016, with about 90% of these for IGD. However, only 153 of the adolescent patients actually turned up for treatment at the clinic. In their absence, the parents and/or other family members consulted with practitioners at the clinic (Higuchi et al., 2017).

A strong therapeutic alliance and the use of motivational interviewing techniques may increase the likelihood of client engagement. However, in some cases, practical measures such as family assistance to temporarily remove gaming equipment (or more feasibly, disconnect the Internet service) and accompany the client to therapy may be necessary. In our experience, adolescents with IGD who are not accompanied by an adult do not attend therapy.

Clinicians should help guide the implementation of social support (e.g., instructions on what parents or carers should say to the adolescent to avoid escalation, strategies for responding to resistance, and assistance with repairing the relationship in the event of conflict). The clinician should *not* make home visits or after-hours appointments to accommodate the client's gaming and sleep-wake cycle, as this will also accommodate the IGD.

Psychoeducation: The main themes

The purpose of psychoeducation is to provide facts that will support the development and strengthening of client insight and reflective capacities. While some time in a therapy session may be set aside for this purpose, psychoeducation is not necessarily a discrete stage of therapy but rather an ongoing process. The client "discovers" new information over time. Psychoeducation occurs as the opportunity arises, such as when the case formulation is developed, or when the client or family is seeking specific information about IGD. The following themes should be addressed.

Normalization of gaming

IGD may be downplayed or denied because gaming is normal. Gaming is a common leisure activity across all industrialized nations of the world. In Australia, it has been reported that 68% of the population play games and 98% of homes with children have gaming devices (Brand & Todhunter, 2015). Sociocultural perspectives on gaming are relevant to an understanding of how gaming is broadly accepted (e.g., East Asian societal acceptance of gaming subculture and the popularity of eSports leagues), particularly within highly urbanized regions that lack alternative leisure opportunities.

Societal normalization of gaming may align with the client's notion of "normal" gaming, including early experiences and upbringing (e.g., family gaming, parental permissiveness around electronic media) and current social situation (e.g., affiliation with peers who primarily play games). The clinical relevance of this theme is its influence on the client's rationalizations that gaming is a relatively safe, healthy, and positive activity, regardless of how it is undertaken, especially when compared against an imagined riskier activity (e.g., drug use, crime). The normalization of gaming also means that gaming is very accessible; therefore, clients should be aware or reminded of the challenges in overcoming IGD (e.g., avoiding opportunities to play games).

Gaming industry

Games are designed to make money for developers and publishers. While scholars have argued the artistic merits of games (Gee, 2006), it should be emphasized that the gaming industry is a business that provides gaming products and services to turn a profit. The "AAA" (i.e., "blockbuster") game industry has multi-million-dollar production budgets and thus a principal concern for game developers is ensuring that their games sell sufficiently well to recover costs and make a profit. Games will be more profitable if they can increase and maintain their player install base, for reasons that are directly financial (e.g., players making in-game purchases, buying copies of the game for others, or buying updated versions of the game) and promotional (e.g., word-of-mouth promotion, online game sharing, or simply playing the game online to keep it populated for other players).

Understanding the gaming industry is clinically relevant because the client may be guided to reflect on the ways in which games are designed for "creative expression" vs "making profits." The dichotomy of artistic and commercial realities may help to challenge unhelpful beliefs about the perceived value of games and virtual items. Some game items are made to be artificially scarce or difficult to achieve to encourage persistent play, which may foster the belief "*I am special if I have this item*". This belief may be reframed as "*the game is designed to make me feel special if I have this item*". The client may then become more aware of how playing games in certain ways ultimately serves the design plans of a commercial entity to maximize play time and profits.

Understanding that games are *products* may be reinforced with reference to design patents that describe the specific ways that games entice the player to spend money. For example, a patent filed by Activision in 2015 (US Patent 9,789,406 B2) describes an online feature designed to match players with other players who had spent money on specific in-game items, to encourage the player to "*make future purchases to achieve similar gameplay results.*"

The design of games

Most games are primarily designed to be entertaining. At the same time, many games will adhere to certain design principles that aim to keep the player engaged for as long as possible. For example, MMO games feature large, persistent online worlds that support social cooperative play and intricate reward systems wherein players aim to accomplish various goals. As they progress, MMO players reach "end-game" activities, the parts of the game where basic level advancement reaches a predetermined fixed-interval cap and it is no longer possible to achieve new levels. End-game activities typically involve "grinding" (i.e., repeatable actions) to achieve a kind of horizontal progression, such as refinement or customization of game items already acquired by the player. The MMO end-game employs time-consuming variable-ratio reinforcement schedules, featuring very low likelihoods of obtaining desired rewards. Players often refer to this as "the grind."

Items with low "drop-rates" become prized among players, who employ optimizing strategies and join groups (e.g., clans, guilds) to maximize their chances of obtaining them. The social aspect of MMO gaming often creates social obligations or pressures on players to play regularly, including at unpredictable times when other players are online. Players may spend more time playing to adhere to an increasingly demanding, rigid or complex, and/or socially dependent schedule of play in pursuit of a specific reward payout.

Developers of games also employ various "tricks" to enhance the experience of success and winning in games. For example, in the action-shooting game *Doom*, the game character has more "health points" than is actually indicated on-screen to increase the probability that the player would believe that he had "almost died" from enemy attacks, thereby creating frequent, exciting "near miss" experiences.

Normalizing feelings related to change

The decision to seek therapy for IGD is usually not made easily. While some individuals may have a strong desire to quit, many who seek treatment for an addiction are likely to feel ambivalent about pursuing a lifestyle that does not involve gaming. In some cases, changing a gaming habit may not be the choice of the client at all. Quitting or reducing gaming will likely evoke feelings of anxiety, frustration, boredom, and sadness for the client. There may also be worries in relation to coping with life stress and spending additional free time. It may be helpful for the therapeutic alliance to validate these mixed feelings and explain that they are typical. Some negative feelings may be reframed as a sign that the client is mentally aware and preparing for the challenges ahead.

Discuss how problems develop

Gaming-related problems can develop quickly and become chronic. Problematic gaming occurs as a function of the interplay of several factors, including biological makeup (i.e., genes, physiology), psychological factors (e.g., depression, life satisfaction, impulsivity), environmental factors (e.g., accessibility and exposure), and social factors (e.g., family support, peers who play games). A reliance on gaming identities and activities to fulfill psychological needs established in early life can set up unhelpful expectations and beliefs about the nature of gaming.

Complex reward schedules in games often enhance the motivation to play games, and they can create the sense that the player is constantly making progress or winning with relatively little required effort. There may be periods in the client's life when gaming reduces or becomes more controlled, which may lead the player to think that gaming is no longer a problem and he can freely partake in games without risk. Life stress and unexpected events may increase the likelihood of IGD symptoms worsening or reemerging after a period of abstinence or controlled use.

The various effects of games on mood states are important to discuss. Craving for games is common and these experiences have been shown to increase in the context of gaming (Dong, Wang, Du, & Potenza, 2017) and decrease when not playing

games (Kaptsis, King, Delfabbro, & Gradisar, 2016). This means that the desire to play games may intensify as gaming becomes more frequent, rather than satiation following prolonged use.

What should gamers expect when they game less often?

Reducing gaming is a major undertaking for individuals with IGD, regardless of the therapy approach. However, the psychological literature on what typically happens for individuals with IGD through this process is surprisingly limited. Practitioners with limited IGD experience may not be able to provide much information to clients on the expected life adjustments and longer-term outcomes of reducing gaming. This contrasts with the ways that medical doctors can usually reassure their patients that certain symptoms are normal after surgery or when taking medication for the first time. The IGD criteria in the DSM-5 refer to "*Withdrawal symptoms when Internet gaming is taken away*" and list mood states including irritability, anxiety, or sadness (APA, 2013, p. 795).

Many individuals with IGD who stop gaming may report an "urge" to play games to reduce unpleasant affective states and satisfy certain motivational drives (e.g., competition, achievement, mastery; see Yee, 2006). For example, we have conducted some prospective studies of "craving for games" among gamers engaged in an 84-h gaming abstinence period (see Kaptsis et al., 2016; King et al., 2016). This work involved measuring participants' affect, psychological distress, and withdrawal symptoms in ways similar to alcoholism research (i.e., craving/urge, thoughts about gaming, and inability to resist gaming). This work has shown that the most typical reactions to gaming abstinence may be broadly characterized as *boredom* and a *drive for mental stimulation*. It is important to note, however, that many gamers will report that these urges occur *even while playing*, meaning that many of these feelings were already present. Reducing gaming enables the individual to become more aware of their presence.

Addressing fear of missing out

Another common experience related to reducing involvement in games is the "fear of missing out" (FOMO; Przybylski, Murayama, DeHaan, & Gladwell, 2013). The FOMO phenomenon refers broadly to the fear that other players are playing the game and having rewarding experiences without the individual. Usually, the fear involves worry and concern that other players are advancing to higher levels or ranks, or acquiring more powerful gear, than the individual. This fosters the belief that the individual will fall behind, meaning that he would be less able to compete against others or contribute to the group. This may be expressed as: "*The less I play, the more I feel I am not part of a group anymore.*"

The feared outcome of being less socially connected or powerful in the game may potentially be true because time investment in games is often related to level or power

attainment, which may be a requirement to maintain involvement in certain social gaming activities (i.e., "keeping up" with others). Clients reducing their gaming may, therefore, initially experience a desire to play to keep pace with the group. This unmet desire may give rise to dysphoria as they become less socially connected. As a 31-year-old female with IGD who reduced gaming explained, "*I miss social interactions with online friends. I miss laughing at them. I miss laughing*" (King et al., 2016).

In line with these different understandings and experiences, some strategies for dealing with "craving" for games may fall into two main categories: (1) relieving boredom or increasing mental stimulation when not gaming, and (2) relieving FOMO or anxieties related to how others' gaming without the client might have various adverse consequences for the client. Some recommended strategies to relieve boredom may involve finding other pleasurable, distracting, or mentally absorbing activities to feel occupied. Developing a routine that involves structured and regularly occurring activities may be helpful, particularly if these activities can develop new skills (e.g., socializing face-to-face) or fulfill life goals. If the client has a partner, they may schedule a regular "date night" that occurs away from the home (i.e., distance from gaming opportunities) and without devices. Physical exercise may be suggested for behavioral activation given its health benefits and reducing effect on Internet use (Kim et al., 2006).

While there have been no empirical studies on strategies to reduce gaming-related FOMO, standard approaches known to reduce fear in general may be appropriate. FOMO is maintained because the client continues to play regularly, thus avoiding the consequences of reduced play. The general principle for therapy is for clients to learn first-hand what happens when their gaming is reduced, and whether their fears match reality.

One way of testing this is to use a CBT writing exercise that involves describing the fear and forecasting the expected effects of missing out on a night of gaming (e.g., game outcomes, the client's feelings, or how other players regard the client). General relaxation strategies (e.g., breathing, muscle relaxation, or meditation to reduce the intensity of the psychosomatic effects of the fear) and mindfulness-based exercises (e.g., noticing the fear in the present moment in a curious and nonjudgmental way, and allowing the fear to occur and pass naturally) may be used if necessary for compliance. However, it is usually better for the client to confront the experience without using these strategies. The client may then examine the evidence for and against the fear, evaluate whether the feared outcomes were consistent with reality, and the overall utility of the fear (i.e., whether the fear was helpful or unhelpful).

FOMO may also be reduced with gratefulness exercises, such as listing all the things that one is grateful for in life and in games, and practicing self-acceptance, by listing positive qualities about oneself that are not related to gaming achievements. The aim of these exercises is to explore and record other ways of viewing oneself, without framing oneself in relation to gaming. The therapist attempts to orientate the client toward more adaptive thoughts related to identity (or "*who I am*") and achievement ("*what I have*") when not gaming. This approach may relieve some anxiety about not playing or redirect anxious thoughts in relation to what the client feels he "needs or should do" in terms of a gaming routine.

Client reflection facilitated by these exercises may lead to a more balanced perspective on gaming activities, as reported by one of our recent study participants, a 33-year-old male with IGD, who made the following statement after missing out on gaming opportunities: "*I know I can have fun without games, so I will now be making sure there is a healthy balance between playing MMOs and other aspects of my life*."

Tailoring therapy to the individual

Treatment must take into consideration the unique needs of the client, including his or her IGD symptom profile and risk/protective factors (see Chapter 3), and gaming-related beliefs and motivations (see Chapter 5) (Lee, Lee, & Choo, 2017). Some therapies will be more appropriate and necessary for some clients than others. The approaches and techniques described in the following sections should be viewed *not* as "one size fits all," but as the potential elements of a program tailored to the case formulation. For example, an individual with IGD who holds strong maladaptive beliefs about the social function of gaming in the context of *social anxiety* may benefit from behavioral activation that includes real-world socialization; monitoring the social functions of gaming (e.g., the "pros" and "cons" of online relationships); strengthening social supports and building healthy real-world relationships; and cognitive therapy for specific beliefs about others (e.g., addressing themes of rejection or abandonment).

As further examples, an individual with IGD and *narcissistic features* who holds maladaptive beliefs about the value of gaming achievement may benefit from therapy aimed at developing insight into the self-related functions of gaming (e.g., inflating one's sense of importance, or gaining admiration); self-monitoring and exposure exercises to recognize the personal consequences of reducing gaming (e.g., worsening self-esteem, increasing narcissistic defenses); and developing non-gaming coping skills to deal with negative emotions.

An individual with IGD and *high impulsivity* may benefit from reorganizing their environment and daily routine to limit the accessibility of gaming (e.g., removing gaming device from the bedroom, scheduling gaming to specific days and having gaming-free days); cognitive therapy that challenges expectancies (e.g., "gaming always makes me feel better") and black-and-white thinking (e.g., "once I start, I should continue to play") about gaming behavior; cognitive control or mindfulness techniques to manage urges to play; and relapse prevention strategies (e.g., decatastrophizing "slip ups"). The client's treatment goals should be incorporated into the care plan to guide measurement of treatment outcome.

Behavioral approaches to IGD

Behavioral approaches are commonly prescribed in the literature to address unhelpful repetitive behaviors. In the first book published on Internet addiction treatment, *Caught in the Net*, Young (1998) proposed a strategy termed "practicing the opposite",

which referred to fostering new behaviors and routines that were dissimilar in action and context to online activities. The basic rationale given by Young was that one could change an undesired behavior by disrupting the usual routine in which it occurred. Behavioral targets for modification in IGD may be gaming behavior, but could also include behaviors that support gaming, such as planning of gaming activities and browsing gaming-related content online. According to Young's reasoning, the context of gaming may be reorganized by moving devices from one room to another or altering the usual time at which gaming occurs. While this approach may be appealing for its simplicity, directing individuals to engage in non-gaming activities in new ways or at different times may be difficult for many clients with IGD, because many may lack the necessary self-control and/or have low motivation to enact these changes.

Self-monitoring

Another technique that may be suitable for ambivalent or resistant clients involves self-monitoring of gaming activities (King, Delfabbro, & Griffiths, 2010). Self-monitoring may involve asking the client to record all the times of the day when gaming occurs, the duration of each gaming session, and the basic outcomes of each session (e.g., change in mood state, game progress, and other consequences). This exercise requires the client to stop regularly to record their behavior, which may curb impulsive decisions and allow time for reflection. Self-monitoring can also provide an excellent overview of the pervasiveness and impact of the client's gaming behavior in the context of other activities.

In 2016, we conducted a study that involved asking 37 adolescent regular gamers, who were referred by parents concerned about their level of gaming behavior, to abstain from games for 3 days and to record the experience. The results indicated that daily self-monitoring exercises were associated with reduced gaming withdrawal (i.e., irritability when not gaming). Self-monitoring on non-gaming days was associated with positive changes to gaming attitudes.

Interestingly, the adolescents were not irritated or resentful about completing surveys or recording their reflections about gaming, even though it interfered with their gaming time. This may have been because the study was framed as a "challenge," which might have appealed to this demographic. Many participants gave positive feedback at follow-up, e.g., "*it is better to be off screens*," "*I feel more appreciative for having these games,*" "*this was proof that I can be without games*," and "*I really enjoyed the challenge*." Self-monitoring may, therefore, offer a way to reduce gaming, without need of instructions to stop gaming or do something else.

Activity scheduling

Activity scheduling is well-recognized as a useful behavioral technique, particularly for clients with IGD who express greater willingness to reduce gaming. Activity scheduling involves identifying "high-risk" times of the day at which gaming usually occurs and scheduling an alternative activity. In learning theory terms, the purpose of the exercise is to introduce an alternative schedule of reinforcement to gaming.

The self-monitoring exercise described above may be complementary to this purpose (e.g., identifying opportune times for alternative activities). While activity scheduling may seem simplistic on face value, in practice it can require careful planning and attention to detail. It is important, for example, that attention is paid to the type of activities being scheduled and the procedural steps involved for the client, so that it is not set up to fail.

Scheduled activities must be specific, practical, and appropriate to the capability of the client (i.e., achievable without difficulty). Activities and the steps involved should be operationalized (i.e., time of day, types of eligible activities) and include guidelines (i.e., use of rating scales to monitor consequences) to avoid any potential confusion.

Contingency management

Gaming is one of the most positively reinforcing leisure activities, relative to the effort required to play. Games are designed to reward players *in some way* each time they play. Contingency management (CM) may be a useful behavioral technique to ensure that the client is "rewarded" (e.g., using money or privileges) for not gaming. CM is based on operant conditioning principles that assume that an alternative schedule of reinforcement may help to override the addictive schedule. CM involves stimulus control (i.e., limited gaming activity) and the administration of an alternative reinforcer in exchange for gaming abstinence or controlled use. This approach, while simple, has been shown to be effective for addictive behaviors, by improving clients' ability to remain abstinent, and therefore, engage with other components of therapy (Petry, Martin, Cooney, & Kranzler, 2000; Prendergast, Podus, Finney, Greenwell, & Roll, 2006).

Exposure and response prevention

Exposure therapy is another useful behavioral therapy option. Exposure therapy for IGD involves the client entering gaming situations that elicit the urge to play where the client does not engage in gaming to relieve this urge (i.e., response prevention). The aim is to provide a supported experience where the client learns that gaming urges will naturally decrease and become controllable without having to play.

Exposure therapy may potentially be more effective if the client does not employ any practical strategies to reduce urges (e.g., relaxation), because "doing nothing" can help to reinforce the notion that urges will reduce without willful action. Exposure therapy may proceed *gradually* by working through a hierarchy of situations that are increasingly more urge-provoking, to overcome urges and other negative mood states (e.g., anxiety or apprehension) in the most manageable and least confronting way.

The *golden rule* of exposure tasks is that the client should not avoid or escape the urge-provoking situation, or play the game, while experiencing an urge to play. The urge should be reduced by around 50% before the client leaves the gaming situation. If the client reports that he played games after participating in the exposure task, it might be useful to focus on how long the client was able to wait before playing and working on increasing this delay.

Homework assignments will often be necessary to give the client sufficient opportunities for practice. The client should enlist other supports, such as a partner or close friend, with whom homework exposure tasks can be supervised or reported back to for feedback and encouragement in between sessions.

Cognitive approaches for IGD

The cognitive therapy approach aims to work with the client's perceptions and beliefs about gaming activities. The therapist works with the client to guide him to "discoveries" about gaming, rather than impose an external view of reality. This is necessary because confronting clients' views will often result in denial or other ego-protective mechanisms.

Cognitive techniques involve assisting the client to reach a point where they are able to propose their own new ideas about gaming and suggest new goals to change. For example, in motivational interviewing, an important task is to explore the positive and negative aspects of a behavior, to develop a sense of discrepancy between the client's view of themself and their behavior. The basic steps involved in this method involve: (1) expressing empathy toward the client and their situation; (2) gently guiding the client to recognize the discrepancies between their goals or values and their behavior; (3) "rolling" with client's resistance (i.e., not challenging, but accepting and exploring their reactions to resistance); (4) exploring the consequences of action and inaction; (5) communicating the notion of "free choice," the idea that the client can select from a range of possible actions; and (6) identifying practical ways of supporting self-efficacy (i.e., the steps involved, barriers and facilitators, and social support).

Socratic questioning

The Socratic method is a guided form of self-discovery that is facilitated by the therapist. The therapy is inspired by the teaching practices of the philosopher Socrates who sought to reveal truth by posing questions to seek answers, often posing questions that involved deductive reasoning using information from previous answers. In this way, the method enables individuals to arrive at new insights based on their existing (sometimes even limited) knowledge. In Plato's *Dialogues*, for example, Socrates demonstrated that the technique could be used on young, uneducated minds to "discover" complicated rules in geometry.

In therapy, the intention of the method is to help the client develop greater insight into their thought processes and how these influence their emotions and behavior. Accordingly, the client becomes aware of maladaptive beliefs and is assisted to challenge them and change the behavior. The guided questioning approach should involve clarification and feedback based on the theme of the discussion. The therapist should model a sense of curiosity and interest, using questions that are phrased to stimulate thought and awareness, rather than require a correct answer. Questions beginning with "why" should be avoided, instead using "what" (e.g., "*What makes you say this*?" or "*What is different about this situation?*").

Once the client's negative thinking styles and maladaptive beliefs about gaming have been identified, the therapist and client can begin to explore the validity and utility of the client's thoughts. This involves asking questions that seek information that support or refute each thought, exploring alternative explanations, asking about the consequences of each thought and their impact on the client as well as the potential effects of changing their thinking.

Daily thought records

A daily thought record is quite similar to the self-monitoring exercise described above, but with the additional focus on thought processes that occur in gaming situations. The purpose of the exercise is to systematically examine thoughts that pertain to gaming that maintain the pattern of persistent gaming behavior. This is achieved practically with the aid of a physical record, usually a table with columns that refer to: (1) *situation* (i.e., the event or trigger for gaming), (2) *automatic thoughts* (i.e., thoughts triggered by the event), (3) *emotions* (i.e., list of feelings that followed the thought), (4) *behavior* (i.e., the actions taken in response to the feeling), (5) *outcome* (i.e., what happened next, including changes in thoughts), and (6) *rational or adaptive response* (i.e., strategies that may help, other ways of considering the situation).

The aim of completing thought records is to assist the client in recognizing that their internal states (thoughts/feelings) are separate, but related to their behaviors and consequences. The exercise provides clients with IGD the means of recognizing that their gaming is a decision-making process in which they have a choice in how to handle situations. Viewing "risky" situations in this way (i.e., as a series of steps in a sequence) may enable new insight for clients in relation to "intervention" points—that is, moments where they can identify thoughts (e.g., "*I need a game to cope right now*") and adjust their negative reactions (e.g., anger or sadness) to avoid an undesirable outcome (e.g., gaming until 5 am in the morning).

Thought records provide useful snapshots of events that enable clients to learn from their experiences and to apply skills (e.g., relaxation, self-compassion, or assertiveness) to deal with the situations that often lead to excessive gaming behavior.

Behavioral experiments

Gaming often commands the player's undivided attention. Therefore, individuals with IGD may rarely challenge their own beliefs about the importance of gaming activities, despite the fact that these beliefs often lead the player to significant personal difficulties. Some clients, such as adolescents, may be difficult to engage using a pure "talking cure" cognitive approach, such as Socratic questioning, due to the relative lack of "hands on" experience.

An active behavioral experiment can be a powerful therapeutic technique to achieve positive change. The purpose of a behavioral experiment is to test unhelpful or maladaptive cognitions and encourage critical thinking and problem-solving that leads to emotional and behavioral change. Given that games will often present players with puzzles and "trial and

error" challenges that require testing hypotheses about game mechanics, the procedural steps of a behavioral experiment might be intuitive to individuals with IGD.

A behavioral experiment is a cognitive-behavioral approach that involves a series of steps akin to applying the basic scientific method: (1) developing a hypothesis that relates to the client's beliefs, (2) planning a way of testing this belief, (3) conducting the "experiment," and (4) reflecting on the findings of the experiment and reevaluating the tested belief. The clinician should reiterate that he or she is working *collaboratively* with the client in designing and running the behavioral experiment with a shared goal of learning, rather than the clinician attempting to reach an undisclosed and predetermined conclusion. An apt analogy for adolescent clients may be two gamers playing a new cooperative game, having no prior knowledge of its levels and challenges, where the objective is to become more familiar with the game and unexpected results or failure is normal.

IGD is characterized by intense preoccupation with games as well as various dysfunctional gaming-related beliefs. Gaming is a complex, goal-oriented activity that requires the attention and practiced skill of the player; thus, many of the beliefs held among individuals with IGD relate to the importance of game rewards and the relationship between gaming and the individual's sense of control, social acceptance, and identity. Some practical examples of behavioral experiments targeting these IGD-based beliefs are presented in Tables 7.2 and 7.3.

Managing realistic beliefs

In Table 7.3, the clients participated in behavioral experiments that yielded results that led to disconfirming unhelpful gaming-related beliefs. However, in some cases of IGD, certain gaming beliefs may actually be realistic (i.e., they tend to accurately forecast the future). In the second case, for example, the client believed that if he were to reduce his social gaming commitments, then he might be criticized or excluded from the gaming group. It was evident that the client in this table had a group of online companions who generally regarded him positively and would likely be understanding of his occasional absence from the game.

However, other clients may discover, in line with their expectations, that their online social circle is less friendly or lenient, or may even be indifferent to the client's online presence. In cases where clients' predictions are likely to be confirmed and lead to negative consequences, it may be more useful to consider the *costs and benefits* of making a change, and the resources available to the client to make this change. To an extent, the case in Table 7.3 was not entirely positive because it highlighted that the client had overestimated the value of some of his online friendships. These online friends reported they did not know him well enough to describe his qualities. In effect, this demonstrated that these online relationships were quite shallow and yet the client was often concerned with acting in ways to preserve them. This finding might have prompted some reflection on whether certain online relationships were meeting the psychological needs of the client and considering the long-term benefits of investing time in the relationships that mainly contributed to gaming behavior that led to personal difficulties.

Table 7.2 Testing thoughts about the value and importance of gaming activities

Problem
The client has a long history of gaming disorder. He spends all of his available time gaming, obsessing about gaming achievements, and rarely engages in other activities or socializing. He often checks his gaming characters' inventories and makes lists of gaming rewards and items he wants to collect. He is often preoccupied with thoughts of gaming rewards and status
Target cognitions
If I can beat the game or reach the highest level, then I will feel better and less anxious. Gaming achievements are my main concern. Games are more rewarding to me than doing other things. Playing every day helps me to deal with stress and feel in control. I need to acquire game rewards for a sense of completion and to have a sense of purpose in my life
Alternative perspective
Gaming activities seem important because I am doing little else. I keep telling myself gaming items and achievements matter because I think about them so much. I often feel stressed when I play games and still feel frustrated after playing a game. There are some rewards in games that I may never acquire and I can accept that. My reward collection can be incomplete
Prediction
If I limit my gaming time or do not play for a whole day, then I will feel worse and not be able to cope with stress. I will miss looking at my gaming character, items, and achievements and I will be constantly thinking about how valuable they are to me
Experiment
Over the next week, the client continued to play games for 8–10 h per day, as usual, for 3 days, and then spent 3 days without playing. While abstaining, the client avoided going online to read gaming news and browse discussion boards about gaming. The client monitored his thoughts about game rewards and his mood at different times of the day As the client felt bored without gaming activities, he engaged in other activities, such as other hobbies (playing a musical instrument) and socializing (spending more time with partner)
Results
On days when the client played games, he was more obsessive about game rewards, rated gaming higher in terms of life importance, and his mood was lower. On gaming abstinence days, the client experienced lower withdrawal to play, felt more satisfied with gaming achievements, and relaxed by engaging in other activities
Reflection
The client was surprised by the results, particularly by his view that many gaming activities were a "waste of time," and how much time was freed up to do other things. He found that he could still enjoy the game even if there were certain rewards he did not have. This flexibility in reward-seeking reduced his overall desire to play

Table 7.3 Testing thoughts about gaming as a means of social acceptance

Problem
The client has a history of excessive gaming in the context of online games. He is a member of an online group that plays games cooperatively every night of the week
Target cognitions
If I am good at the game, other players will respect me. Other players take me seriously and admire my gaming achievements. I need to play regularly or I will miss out on what others are doing or be criticized for not helping the team. People in the real world will reject me
Alternative perspective
I am worthy of being liked even if I do not play games. I have good qualities that are not related to gaming achievement. I can miss out on gaming sometimes and still be liked by others. There are places other than gaming worlds I might fit in socially. I can be someone other than a "gamer"
Prediction
If I ask other players what they like about me, they will focus on my gaming achievements. If I ask people in my life who are not gamers to describe me, they will not have anything meaningful to say. If I tried to socialize in a non-gaming situation, I would feel uncomfortable and people would ignore me or I would make a fool of myself
Experiment
During the week, the client asked his friends and family, and his online companions, to say or write down what they saw as his positive qualities. He felt embarrassed about doing this, but was relieved that nobody objected, despite some good-natured ribbing from his online friends A second experiment involved the client having a brief face-to-face conversation with a stranger on any topic unrelated to gaming
Results
The client's online friends referred to personal qualities that included his sense of humor, loyalty, and willingness to help others, but did not mention gaming achievements per se. Some of his online friends said they did not really know what to say. Family and friends referred to the client's intelligence and problem-solving, sense of humor, and calm and friendly nature The client had a brief conversation with a girl serving at a café. This interaction went relatively smoothly and without any sign that she was uninterested or ignoring him
Reflection
The client concluded that his gaming companions did not pay as much attention to his gaming achievements as he thought they did. They tended to enjoy his company for his personal qualities. He realized that some of his online relationships were anonymous and superficial. He was surprised that his family had listed so many positive qualities about him. He was particularly affected by the ways they admired him as a person that were unrelated to gaming The client reflected that his conversation with the girl at the café felt awkward but it might mean that he could have further success in non-gaming social interaction in the future

Relapse prevention

An important aim of therapy for IGD is reducing the likelihood of relapse. According to the relapse prevention model (Marlatt & Gordon, 1985), an individual with IGD is more likely to relapse in the presence of high positive outcome expectancies (i.e., thoughts that gaming will lead to desirable outcomes, or relieve a negative emotional state) and low self-efficacy (i.e., a lack of confidence in one's ability to resist the temptation to play games).

Effective relapse prevention entails a plan to help enable the client to recognize the thought and behavior patterns that lead to problematic gaming and to learn and use new, more adaptive ways of coping. A useful component of relapse prevention is developing strategies (e.g., harm minimization strategies in Chapter 8) to limit exposure to stimulus conditions that elicit gaming behaviors. For example, removing gaming devices from the bedroom, deleting shortcuts to gaming websites, engaging in new activities, and having less regular contact with online gaming companions may help to limit the number of triggers to play games.

Treatment gains are more likely to be maintained under conditions that reinforce the practical messages of treatment. A client with IGD may be encouraged to talk openly within their social support network about the steps taken within and outside of therapy to address problematic gaming. For example, this may involve talking with family about how gaming had led to major sleep disruption and interpersonal conflicts, and how the individual curbed their playing by learning to challenge inflexible ways of thinking about games. Reminders of the lessons and learning from therapy (e.g., strategies for managing urges, psychoeducation about gaming addiction, and the outcomes of behavioral experiments) in the form of cue cards (or notes on a smartphone) may be helpful for the client to consult in "high-risk" situations. For clients who plan to control (not abstain from) their gaming, the relapse prevention plan should delineate the signs of healthy versus maladaptive gaming for the client.

The plan should also include an "emergency plan," or details on what to do when the client has difficulty in adhering to posttreatment goals or has reverted to previous patterns of problematic gaming. This plan may include a reminder to decatastrophize relapses (or "slip-ups"), a description of the skills and strategies the clients should revisit and practice and a list of contacts for support.

Family-based approaches for adolescents

Many adults with IGD may spend much of their gaming time alone or under minimal social surveillance. In contrast, adolescent problematic gaming tends to occur in the context of a family home, where conflict can often arise between the adolescent and parents or guardians about the amount of time spent gaming and its various impacts. Parents may have negative attitudes toward gaming (e.g., "*gaming is a waste of time*") and attempt to assert authority by removing gaming devices from the adolescent. This may result in escalating conflict that culminates in total relationship breakdown.

Research studies have reported that a range of familial influences, such as the parent-child relationship and parental restriction and monitoring of media use, can be protective factors under the right conditions, but these factors may also influence the development and progression of problematic gaming (Schneider, King, & Delfabbro, 2017). Family factors in IGD have been widely documented in East Asian regions, where many adolescents experience strong familial pressures and cultural expectations to succeed academically, and these factors are thought to contribute to youth choosing to escape into Internet gaming cafés (Lim, 2012).

A treatment approach to IGD that is focused only on the adolescent as "the problem" may, therefore, overlook some of the important ways in which parents influence and maintain the adolescent's gaming behavior (e.g., rejecting parental style, harsh communication style, and lack of rules and boundaries for gaming). The active therapy involvement of parents or other family may help to address unhelpful social interactions and/or rally supportive family members to be a positive influence in the adolescent's recovery.

Despite the fact that some parents might be productively included in therapy, the IGD treatment literature has tended to focus only on the adolescent in therapy (i.e., individual- or group-based treatments). One recent study that was an exception to this trend was conducted by Liu et al. (2015), who administered six 2-h sessions of multifamily therapy to 46 adolescents with Internet addiction and compared their IA outcomes to a waitlist control group. The rationale of the treatment was that problematic Internet-related behaviors were primarily influenced and maintained by a lack of parent-child closeness and communication. The aim of the therapy was to teach skills that enabled bonding between the adolescent and parents to increase intimacy and, in turn, reduce the adolescent's reliance on online activities to fulfill social and other needs.

In contrast to many flawed IGD treatment studies, Liu et al.'s (2015) study design included both a follow-up assessment and a measure of diagnostic change posttreatment, which enabled a very precise statement of the treatment benefits. They reported that the "*Internet addiction rate dropped from 100% at the baseline assessment to 4.8% at the end of the intervention and remained at 11.1% at the three-month follow-up assessment*" (p. 6). These gains are exceptional in comparison to other published IGD treatment studies and highlight that involving family in treatment of adolescents with IGD may be invaluable to achieving longer-term gains. Liu et al.'s (2015) 12-h treatment protocol is comparable (if slightly more intensive) to most CBT programs for IGD (which usually range from 6 to 8 sessions), but it is arguably assisting more than one individual in a direct way, and therefore, this approach may be considered more cost-effective than single-person treatments.

While Liu et al.'s (2015) study reported promising results, the paper provides minimal information on the procedural steps of the intervention. Day (2017) and Young (2009) have provided some practical resources on family-based therapy approaches to IGD. Day (2017) explains that the first step of family-based therapy is to help the adolescent and family members to examine their current views about the gaming problem and prepare the family to make a change together. This involves encouraging the family to discuss their "resources" to make a change and give practical examples of past success and resilience in the family. This discussion may shift the family from a

position of viewing the gaming problem as being "stuck" or "unfixable" to "possible to change." The clinician may explore the range of familial influences underlying the adolescent's gaming to frame the IGD as a systemic issue that has been maintained by all members of the family (Young, 2009). A genogram may be helpful to "map out" these influences and the ways that they may combine and impact the adolescent.

Day (2017) also refers to the process of the family "taking ownership" of the gaming problem. Each family member is encouraged to describe and understand their role in helping to change the gaming problem. For example, one action that may be identified is arguing with the adolescent about gaming time and its role in perpetuating the gaming problem. Family members may agree to avoid this behavior and practice new styles of communication and conflict resolution. Young (2009) suggested that some of these interactions might be "enacted" during a therapy session so that the therapist can observe and help to "reframe" (i.e., help the family to understand each other's perspectives) and "restructure" these interactions (i.e., guide family members toward supporting each other's needs).

Another type of plan may involve improving time management and household responsibilities in the family, by making a shared agreement on the concrete expectations of all family members to contribute and be accountable in the household. The family may also support the adolescent to develop and expand his identity beyond an online gaming persona into more real-world interactions and activities (Allison et al., 2006). Later in therapy, the clinician and family can explore relapse prevention options, including making further changes to the home environment or strengthening other aspects of the family system.

Residential and camp approaches

Problematic gaming behavior cannot occur in an environment that does not support gaming. An assortment of residential and "digital detox" camp approaches to IGD have emerged over the last decade based on this simple principle. Residential programs for IGD and other types of problematic Internet use (e.g., online social networking) have become available in several countries, particularly throughout some East Asian regions.

Some of the most publicized programs are located in the United States (e.g., the *reSTART Internet Addiction Recovery Program* in Seattle, and the *Internet Addiction Treatment and Recovery Program* at the Bradford Regional Medical Center in Pennsylvania), Japan (e.g., the *Self-Discovery Camp* operated through the Kurihama Medical and Addiction Center), and South Korea (e.g., several programs provided through the National Center for Youth Internet Addiction Treatment).

There are also "boot camps" in China and South Korea that accept involuntary admissions of adolescent problem gamers (see Koo, Wati, Lee, & Oh, 2011; Stone, 2009). These camps have been the subject of controversy following reports of military-style disciplinary methods attracting international media attention. Peer-reviewed academic papers on the operation and success rate of these approaches are very limited. Currently, the most informative resources appear to be news stories and documentaries

(e.g., the VICE documentary on eSports and addiction, "*The Celebrity Millionaires of Competitive Gaming*" or Shosh Shlam's 2013 documentary "*Web Junkie*" about Chinese boot camps).

The basic approach of residential programs and camps appears to be to facilitate a closed environment where individuals have no access to digital technology during their stay. Camp participants are supported to develop social skills and self-confidence as well as basic independent living skills (e.g., cooking, cleaning, and time management). This approach is considered to be effective in reducing gaming-related problems because all cues and opportunities to engage in behaviors that create problems are eliminated. The programs are thought to reduce craving and teach necessary skills to lead a more balanced lifestyle.

Anecdotal evidence (e.g., patient testimonials and mass media news articles) has suggested that these approaches have some success in reducing gaming and online behaviors and developing new skills in some cases. However, there is a lack of empirical data on the efficacy of these approaches. It bears noting that private residential programs are very expensive (e.g., $30,000 for an 8-week stay). A cost-benefit analysis of these approaches compared to standard therapy has not yet been conducted.

Some research evidence lends support to "detox" camp approaches. A recent study by Sakuma et al. (2017) examined the outcomes of a therapeutic residential "self-discovery" camp for 10 adolescent problematic gamers. The camp lasted for 9 days, during which time all participants were unable to play games. Camp activities included outdoor cooking, a walk rally, trekking, and woodworking. The researchers explained that the purpose of these activities were: (1) to foster awareness of health, wellness, and a well-regulated life; (2) to experience communication without the Internet or digital devices; and (3) to collaborate with others and solve problems. Sakuma et al. reported that the camp had improved adolescents' recognition of gaming problems and increased their self-efficacy. Interestingly, after returning home from the camp, it was noted that participants "were still gaming almost daily" (p. 359). However, their mean daily gaming time had reduced from about 10 h to 6 h.

Summary: The call of duty of care

The inclusion of IGD in the DSM-5 was a signpost of the need for evidence-based treatment for problematic gaming. The literature on IGD treatment is currently developing slowly, with only one RCT in this area published in the last 3 years. Studies have referred to a range of different therapies and/or techniques, but there are very few specialist IGD treatment manuals published or in the public domain. The lack of high-quality clinical research means that there is currently no "gold standard" approach to treating IGD, even with respect to CBT which is the most frequently employed therapy in trials.

The tentative status of IGD and the complex interplay of academic, medico-legal, government, and regulatory factors in this area have arguably had a restricting effect on the evidence base. Scientific progress has also been hindered because many

governments have not widely funded specialized gaming or other Internet-related disorder treatment services and research. For example, Australia's leading expert body for health and medical research, the National Health and Medical Research Council (NHMRC), has not funded a project on gaming or Internet-related disorder in its history. Public services in many countries where IGD is prevalent do not offer treatment for IGD for eligibility reasons, which has opened the door to private providers offering a range of nonstandard, expensive, and unproven treatment services.

Many of the above limitations and unknowns in the IGD literature are to be expected in a new field of study. A stronger evidence base will come with time. However, simply conducting more trials will not advance this field on its own. To improve treatment and service delivery, there remains a need for studies that can provide greater insight into the core psychopathology of IGD and its subtypes. Such work is necessary to provide the foundation for interventions equipped to meet the challenge of delivering optimal and cost-effective outcomes for clients.

Greater transparency or full disclosure of approaches used in studies and in structured programs would greatly benefit the study of treatment, particularly in relation to psychological approaches (e.g., CBT) where there seems to be limited agreement on the targets for therapy. Greater collaboration among theorists and clinicians would help to develop and refine ideas on the nature of IGD and apply these ideas to develop a model for best practice in treatment. Given that there are numerous uncertainties in the field, practitioners may be best served by taking an open-minded but cautious approach when consulting the IGD evidence base.

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Prevention and harm reduction for IGD

8

Chapter Outline

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Introduction and overview

Although there is ongoing debate among experts on the core psychopathology of Internet gaming disorder (IGD), including whether IGD should be considered an addictive disorder, there is general agreement that gaming may become problematic when engaged in at high levels, particularly among children and adolescents (Gentile et al., 2011; Kuss & Lopez-Fernandez, 2016; Kwon, 2011; Przybylski, Weinstein, & Murayama, 2016).

From a public health perspective, participation in gaming activities may be viewed along a spectrum, where most individuals tend to engage in "safe" levels of gaming (i.e., gaming that does not produce any significant negative consequences for the user or others). A small proportion of individuals may "misuse" gaming products and services in different ways and to varying degrees of regularity. Misuse refers to gaming that has negative consequences for the user or others, due to excessive use or the displacement of other activities or important responsibilities. At the other end of the spectrum are a very small proportion of the gaming population who could be considered "pathological" users (i.e., individuals with IGD) and who frequently display patterns of statistically abnormal gaming behavior that can contribute to harm. This most seriously affected group has been estimated using meta-analysis to constitute around 3% of the population (Ferguson, Coulson, & Barnett, 2011); however, some researchers have estimated this figure to be smaller (between 0.5% and 1%) as based upon more stringent analysis methods that used more refined indicators of harmful impacts (Przybylski et al., 2016).

Effective prevention strategies aim to cater and respond to the unique needs of these different risk groups, with the overarching goal of preventing the onset of new gaming-related problems and preventing the progression of existing problems to more severe manifestations. The evidence on IGD prevention is unfortunately one of the least developed areas of this emerging field. This may be due to some uncertainty among researchers on prevention targets and which strategies may be effective for whom at what time. While IGD treatment studies have tended to translate techniques directly from treatment protocols for substance use disorders with some degree of success, on the assumption that gaming is "just another addiction," there have been few programmatic responses and recommendations for managing individuals with lower or less risky levels of gaming. This may be because gaming (and electronic media use in general), particularly among young people, is highly prevalent and does not have the same negative health consequences associated with low to moderate use of substances such as tobacco, cannabis, and alcohol.

Gaming is *not* considered to be inherently problematic even when occurring frequently (Király et al., 2017). A range of commercial games are even intended for use by children, including many of the most popular games (e.g., *Pokémon*). A young child quietly playing a handheld gaming device is a commonplace sight in many contexts that does not provoke alarm.

This chapter will provide an overview of some of the different approaches to IGD prevention and will summarize available research evidence and its policy implications. International case examples will be described, including regions in East Asia, such as

South Korea, that have invested strongly in programmatic responses to problematic gaming (Lim, 2012). The role of parents in restricting gaming products and gamers' perspectives on prevention measures will be critically examined. These issues will lead to a discussion of the industry's position on social responsibility and current practices in this area.

The key message of this chapter is that the task of reducing the risk of IGD in vulnerable populations requires the sustained efforts of *multiple* collaborating systems (e.g., family, peer networks, and education), especially during the vulnerable developmental period (i.e., 12–25 years) when addictive disorders usually take root (Chambers, Taylor, & Potenza, 2003). Although gaming disorders have not been universally recognized as a public health problem, it is likely that similar principles and frameworks can be broadly applied.

The aim of public health approaches is to provide interventions at different levels, ranging from broader primary approaches that prevent the development of harm; those which attempt to minimize or reduce harm in those already engaged with the activity; and to reduce harm in those who are already affected. It will become evident during this chapter that these principles are generally implicit in many of the arguments advanced and in the interventions that have been proposed to address IGD.

Gaming as a way of life

The normalization of gaming is a significant consideration for prevention measures. Gaming is a normal part of everyday life for many people, and a dominant leisure culture in countries where it occurs, and it has only been prohibited to some extent in very few isolated cases. Gaming behavior in industrialized countries also tends to commence at a very young age. For example, our Australian data have shown that current adolescent gamers first began gaming at an average age of 8 years (King, Delfabbro, Zwaans, & Kaptsis, 2013). Thus, involvement in gaming activities will tend to precede formal logical reasoning ability for many individuals. Rather than being initiated by independent acts of planning and judgment, early gaming experiences are facilitated by parents or carers, either *directly* by giving a child a gaming device to own and use, or *indirectly* by enabling play with others in gaming-supported environments.

Many schools now incorporate digital devices into teaching practice, granting students access to laptops and tablets in the classroom and at other times. Thus, when gaming problems develop, modifying usage and routines may be difficult against a background of habitual use of electronic devices within environments that have encouraged technology use as an acceptable, even necessary, activity. "Early" prevention strategies targeting adolescents may often be attempting to modify gaming attitudes and behaviors that have been ingrained for years. These individuals are "digital natives" who do not know a world without online gaming.

Digital gaming is one of the most accessible and affordable entertainment products in the developed world. It is a billion-dollar industry that continues to grow each year. The enormous size and reach of the gaming market complicates the task of reducing gaming exposure and the effective regulation of gaming products and services,

particularly in online environments. The consumer advice on some gaming products states accordingly, "*Game experience may change during online play.*"

To date, the gaming industry has been minimally engaged in social responsibility practices in response to growing attention on IGD and gaming misuse. The gaming industry may believe its interests are best served by promoting gaming as a normal, safe, and family-oriented activity and ignoring, downplaying, or reframing any potential downsides to gaming. Similar concerns about corporate influences on research and public policy have been raised previously in relation to alcohol (McCambridge, Hawkins, & Holden, 2014), tobacco (Friedman, Cheyne, Givelber, Gottlieb, & Daynard, 2015), and gambling (Cowlishaw & Thomas, 2018).

The Interactive Games and Entertainment Association (IGEA) is an independent industry association in Australia and New Zealand that finances and promotes consumer research on gaming. The IGEA has publicized data drawn from large samples (i.e., thousands of households in Australia) that portray gaming as a "mature," "social," and "family-oriented" activity (Brand & Todhunter, 2015). This positive representation is certainly not false, but it gives a selective or incomplete view of the population. Gaming habits, for example, are reported as "*an average of 88 minutes per day*," which overlooks extreme values that may be reasonably indicative of potential misuse. The survey seems to be quite one-sided by design and fails to ask the "hard" questions, like: "*Does anyone in your household play games too often?*" or "*Has gaming led to any conflict or other problems in your home?*"

Types of prevention

The prevention of harm can be conceptualized as including one or more of the following:

(1) preventing a problem behavior from ever occurring;
(2) a delay in the onset of a problem behavior;
(3) a reduction in the impact of a problem behavior;
(4) strengthening knowledge, attitudes, and behaviors that promote emotional and physical well-being; and
(5) promoting institutional, community, and government policies that further physical, social, and emotional well-being of the larger community (Romano & Hage, 2000).

Unlike some public health burdens (e.g., tobacco products) with clearly defined levels of harm, defining the levels or types of gaming use that are detrimental to users is less straightforward. Although many gaming activities, including those occurring online and offline, may be considered "addictive" for some users (Griffiths, 2009), these activities would not be classified as inherently harmful, or incrementally harmful according to level of use (Gentile, 2009). Gaming can be adaptive, productive, socially significant, and increase the psychological well-being of users (Sublette & Mullan, 2012; Yee, 2006). IGD prevention should, therefore, not intend to reduce population-level gaming to its lowest possible point, nor impose restrictions upon healthy gamers. Table 8.1 provides an overview of the following three types of prevention strategies employed to address gaming misuse and IGD specifically.

Table 8.1 Prevention strategies for gaming misuse and gaming disorder

Strategic target	Level of prevention		
	Universal	**Targeted**	**Indicated**
Gaming misuse (i.e., excessive or risky levels of use, unhealthy levels of use)	*Legislation and enforcement* – Shutdown/fatigue systems – Ban or restriction on Internet use – Retail POS restrictions (e.g., R18+ rating) *Technological measures* – Use of appropriate media – Parental locks and limit-setting – Smartphone apps – Use of watches – Internet speed restriction/"throttling" – In-game feedback for breaks *Education and guidelines* – Physical activity recommendations – Engagement in alternative activities – Digital media literacy training – Safe gaming use orientation courses – Promotion via youth media ambassadors – Avoid/minimize riskier game types	*Education and programs* – Education on healthy gaming – Address comorbid mental health issues – Youth empowerment approaches *Legislation and enforcement* – Reduce opening hours for Internet cafes – Regulations for safe use *Workplace Internet policies* – Proactive vs reactive policies – Staff training and central monitoring *Regular examination and screening* – Screening risky use (GP, MH providers) – Stress management – Self-monitoring online activity *Parental role* – Family media agreements, limit-setting – Facilitate alternatives to Internet use	*Support groups* – Online self-help communities – Community groups *National health guidelines* – Exercise and diet – Screen time restrictions *Education and awareness* – Self-monitoring/Limit-setting – Goal-directed Internet use – Awareness days (e.g., "Smart Off Day") *Mental health services* – Treatment for primary disorders *Outpatient medical services* – Treatment for medical disorders (inc. pain, injury, other illness) – Psychosocial rehabilitation

Continued

Table 8.1 Continued

Strategic target	Level of prevention		
	Universal	**Targeted**	**Indicated**
Gaming disorder (i.e., meets criteria for DSM-5 or ICD-11 gaming disorders, psychiatrically verified Internet-related problems)	*Legislation and enforcement* – Restrictions on riskier games (e.g., MMOs) – Shutdown/fatigue systems *Technological measures* – Online monitoring of use – Clinical user feedback apps – Game account deactivation (voluntary) – Device-free environments (e.g., bedrooms) *Education and guidelines* – Defining Internet gaming disorder – What is healthy gaming – Relationship of IGD to other disorders – Target student population – Interactive lectures/workshops	*Education and programs* – Education for users/carers – Self-control/self-regulation strategies – Contingency management & goal-setting – Regimented exercise/outdoor activities *Regular examination and screening* – Mental health checks – Epidemiological surveys on IA – Online self-assessment of IA criteria *Technological measures* – Limit-setting software *Parental role* – Family media agreements, limit-setting – Facilitate alternatives to gaming	*Support groups* – Online self-help – Community groups – Community engagement/ mentors *Rehabilitation programs* – "Digital detox" – Boot camps and retreats – Hospitalization – Psychosocial rehabilitation – Exercise programs *Psychological therapy/ pharmacology* – CBT/ACT/MI therapy – Group/individual-based – Medication (e.g., antidepressants)

ACT, acceptance and commitment therapy; CBT, cognitive-behavioral therapy; GP, general practitioner; IGD, Internet gaming disorder; MH, mental health; POS, point of sale.

Primary or universal prevention

Such strategies refer to measures that target the general population, irrespective of known risk level, with the intent of holding gaming behavior at low (i.e., safe) levels. This approach assumes that all individuals who play games may be at risk to some degree and can, therefore, benefit from information and skills to prevent the occurrence of associated problems (e.g., sleep disturbance, relationship conflict, work interference, negative mood, and/or social isolation).

Strategies include:

(1) *educational resources*, such as guidelines on healthy levels of use (e.g., playing no more than 2 h of use per day [American Academy of Pediatrics, 2011]), digital literacy courses to increase productive Internet use, physical activity recommendations (e.g., 30 min of moderate exercise per day) (World Health Organization, 2011), and the promotion of structured outdoor activities;
(2) *legislative or regulatory actions*, such as mandated shutdown of online gaming services at certain times of the day (Sang, Park, & Seo, 2017), and the prevention of sale of certain gaming products to certain age groups;
(3) *technological measures*, such as parental locks, inappropriate content filters, and time-limit settings on gaming consoles, wearing watches instead of carrying smartphones, pop-up notifications for time spent on a device;
(4) *public awareness messages*, such as national days that encourage nonuse of digital technology, and IGD campaigns to provide information on relevant services; and
(5) *environmental measures*, such as reducing accessibility to gaming devices, including removing devices from bedrooms (e.g., Xu, Turel, & Yuan, 2012).

Secondary or selective prevention

Selective prevention strategies typically focus on individuals more at risk of developing gaming-related problems. For example, male adolescents are more at risk of IGD (King & Delfabbro, 2016; Rehbein, Kliem, Baier, Mößle, & Petry, 2015), particularly those with comorbid disorders (e.g., attention deficit problems, mood disorders), lower social functioning or confidence, lower academic ability or school engagement, a lack of non-gaming interests, and low family support or inadequate supervision (King et al., 2013). Prevalence data suggest that East Asian adolescents may be particularly vulnerable to IGD, owing to greater availability of gaming and cultural differences in this region (Fang et al., 2015; Mak et al., 2014). Universal and selective prevention sometimes overlap, given their shared goal of reducing gaming behaviors and increasing participation in alternative activities.

Selective prevention strategies include:

(1) *regular screening*, including epidemiological research to identify at-risk populations, typically in schools and universities (e.g., Lawrence et al., 2015);
(2) *medical checks*, including consultation with medical practitioners to screen for emotional distress or underlying problems that may increase risk of gaming as a maladaptive coping strategy;

(3) *school-based educational programs*, such as programs that teach healthy technology use, promote real-world social interaction, and support hobbies and physical exercise to increase self-esteem and empowerment (e.g., Shek & Yu, 2012); and
(4) *workplace Internet policy*, or rules for Internet access privileges for nonessential purposes in vocational settings, to prevent individuals from browsing gaming-related websites and accessing online gaming servers.

Tertiary or indicated interventions

Indicated prevention strategies generally target individuals who are already considered problematic gamers. Such interventions involve the provision of formal services where people with problems can seek assistance. However, having said this, a present challenge for the development of services of this nature is that IGD is not a recognized diagnosis in countries such as Australia and cannot be used as the basis for a medical referral. As a result, individuals with severe gaming-related problems in some Western countries such as the United States and the United Kingdom, for example, would not be recognized as eligible for publicly funded addiction treatment, although such individuals might still seek treatment without a diagnosis from a professional service that claims to treat the condition (e.g., the reSTART program in the United States, founded by Dr. Hilarie Cash with others). In some cases, referrals might have to be made on the basis of comorbidities of problem arising from involvement with gaming or which coincide with it (e.g., depression, social isolation, and problems with physical health).

The most common forms of indicated or tertiary strategies can include:

(1) *support groups*, including community groups and online self-help communities;
(2) *outpatient medical and mental health services*, including treatment of mental disorders (e.g., mood disorders, personality issues, insomnia) and medical problems (e.g., pain issues, injuries that prevent employment) that may underlie or contribute to gaming problems;
(3) *psychosocial rehabilitation*, including "digital detox" and other structured programs with a focus on increasing face-to-face socialization, time spent in nature, and developing alternative interests; and
(4) *psychoeducation*, including specialized information about symptoms and strategies for regulating gaming to minimize harm. See Chapter 7 for more detail on IGD treatment, including a review of the research evidence over the past decade.

Global understanding of prevention evidence

Since 2014, the World Health Organization (WHO) has taken a strong interest in behavioral disorders and become increasingly active in responding to global concerns about problematic gaming. Specifically, the WHO has been involved in working collaboratively with numerous regional health authorities to identify adequate public policy and health sector responses. The organization has coordinated several international meetings with the purpose of discussing clinical descriptions, diagnostic guidelines, and priorities for international research.

To date, these meetings have been held in Tokyo, Japan (2014), Seoul, Republic of Korea (2015), Hong Kong SAR, China (2016), and Istanbul, Turkey (2017). Experts from more than 20 countries and five WHO regions have participated in these meetings. One of the main outcomes of the meetings was the development of the "Gaming disorder" classification for ICD-11.

The 2016 WHO meeting was the most pertinent to the area of prevention; this meeting identified that there has been marked variability between Eastern and Western countries in the prevention of disorders due to excessive use of gaming platforms. The WHO commissioned a background report on the topics of prevention and regulation, and service organization and delivery for this meeting. This report has since been published (King et al., 2017) and its main findings will be summarized in this section.

The 2017 review reported that there have been relatively few empirical studies on prevention and/or reduction of problematic gaming, in comparison to research on treatment (see Chapter 7; King et al., 2017). Most of this work has been conducted in East Asian countries (i.e., South Korea, Japan, and China). Table 8.2 presents a summary of 13 quantitative studies on prevention, covering regions including South Korea ($n=6$), China or Hong Kong ($n=2$), Germany ($n=2$), the United States ($n=1$), Spain ($n=1$), and South Africa ($n=1$). For context, over the last 5 years, these East Asian countries have implemented: (i) school-based programs; (ii) mandatory technical systems to reduce gaming (e.g., shutdown/blocking software); and (iii) national health policies that recognize gaming disorder.

These approaches contrast with the less structured interventions in other regions, such as brief workshops (Spain), online education (United States), and public health messages to set limits on use (Germany). Regional differences reflect to an extent the availability in funding and governmental support for this research. Many more studies have been conducted in East Asia, but they were not included in the review because they were not published in English and/or were not indexed in scientific databases (e.g., *Web of Science*). For reference, a recent systematic review by Yeun and Han (2016) has reported on 37 studies of prevention in the broad area of "Internet addiction" (i.e., including but not specifically focused on IGD).

A focus on school-based programs

IGD prevention programs tend to recruit adolescents. Nine out of the 13 studies were undertaken in secondary or elementary student populations, with a combined sample of $N=9395$. Studies have tended to assess the short-term benefits only, with studies having limited or no follow-up measures. There has been only one randomized controlled trial (RCT) (Walther et al., 2014). Psychoeducation has been the dominant approach in adolescent research. The content of psychoeducation has included: (1) helping adolescents to understand the concept of problematic gaming; (2) teaching stress management and self-control techniques; (3) developing social relationships; (4) limit-setting and time management skills; and (5) identifying alternative activities, including physical activities. These modules are consistent with IGD treatment programs for adolescents (King, Delfabbro, Griffiths, & Gradisar, 2012).

Table 8.2 An overview of prevention strategies for gaming and Internet-based disorders

Study	Sample	Design	Prevention type	Strategies	Duration	Findings	Region
Yang and Oh (2007)	269 elementary school students	Repeated measures, quasiexperimental; controlled	Selective	*School-based education* – Stress and coping – Time management – Friendship – Alternative activities	6 weeks	The program led to no significant change in Internet gaming playing time, but significant improvement in self-control scores	SK
Joo and Park (2010)	48 middle school students	Pretest-posttest design; controlled	Selective	*School-based education* – Stress-control – Social relationships – Time management – Self-control	8 sessions	The program reduced IA scores and stress levels, and increased sense of empowerment	SK
Shek and Sun (2010)	6978 high school students	Six-wave longitudinal; controlled	Selective	*Project P.A.T.H.S.* – Broad-based positive development youth program	3 years	The program benefited youth development and increased self-restraint using the computer	HK
Lee (2012)	600 child-mother pairs	Cross-sectional survey design	Selective	*Parental restrictive mediation of Internet use* – Limit setting – Prohibition	Varied	Restrictive mediation significantly reduced time spent online but did not affect IA	SK

Deng et al. (2013)	143 high school students	Pretest-posttest design; controlled	Selective	*School-based education* – Pros-cons analysis – Goal setting – Psychological needs – Alternative choices	3 sessions	The program reduced IA scores in the prevention group but clinical change was minimal	CH
Koo (2013)	58 elementary students	Pretest-posttest design; controlled	Selective	*School-based education* – Understanding media – Self-understanding – Control of media use	10 sessions	The program significantly improved in television addiction, but there was no change in IA at posttest or 2-month follow-up	SK
Lee, Ahn, Choi, and Choi (2014)	14 adults	Pilot study	Selective/ Indicated	*SAMS Smartphone app* – Usage monitoring – Behavioral feedback – Notifications/ pop-ups – Interface with clinicians	1 week	Results demonstrate feasibility of an app to change behaviors, but there may be some measurement problems	SK

Continued

Table 8.2 **Continued**

Study	Sample	Design	Prevention type	Strategies	Duration	Findings	Region
Walther, Hanewinkel, and Morgenstern (2014)	1843 secondary students	Randomized controlled trial	Selective	*School-based education* – Self-monitoring – Understanding addiction – Self-reflection – Gaming preferences, motives, and time	4 sessions	Students in the intervention group reported less gaming time, less excessive gaming, but Internet time did not change greatly. The intervention yielded clinical change in IA	DE
Fontalba-Navas et al. (2015)	1200 high students	Summary of intervention	Selective	Workshop for adolescents	1 session	No published results	ES
Montag et al. (2015)	3084 adults	Cross-sectional survey	Universal	Analogue zeitgebers (wristwatch/analogue clock)	Daily use	Use of analogue zeitgebers (watches) decreased time spent on smartphones	DE
Mun and Lee (2015)	56 elementary students	Pretest-posttest design with nonequivalent control group	Selective	*School-based program* – IA education – Empowerment – Behavioral modification	8 sessions	The program significantly reduced IA scores and Internet use, and improved self-regulation scores	SK

Turel, Mouttapa, and Donato (2015)	223 adults	Pretest-posttest design	Selective	Video-based education intervention	Single view	Educational video on Internet use significantly changed viewers' attitudes toward decreasing Internet use	USA
Davies and Blake (2016)	31 adults	Pretest-posttest design; three counter-balanced conditions (including control)	Indicated	Shutdown and fatigue systems to limit game play	3 sessions	Longer game time on fatigue systems than on shutdown systems. Players in shutdown condition reported stronger intention to return to gaming. Shutdown produced strongest negative affect	ZA

CH, China; DE, Germany; ES, Spain; HK, Hong Kong; IA, Internet addiction; NA, not assessed; SAMS, smartphone addiction management system; SK, South Korea; ZA, South Africa.

Trialed programs have tended to be relatively brief. The typical duration of school-based prevention programs ranges from three to 10 sessions, with an average of 6.5 sessions. Four studies have reported a successful reduction in symptoms of problematic gaming (Deng et al., 2013; Joo & Park, 2010; Mun & Lee, 2015; Walther et al., 2014), which is commendable given that a nonclinical population would have relatively low (i.e., healthy) baseline scores, making it difficult to detect changes using this measure. However, there have been mixed outcomes for these programs in reducing time spent engaged in gaming and on the Internet, with one study reporting a reduction in Internet use (Mun & Lee, 2015); another study reporting no change (Yang & Oh, 2007); and one reporting decreased online gaming, but no change in Internet use (Walther et al., 2014). Unfortunately, these studies did not report on the financial cost of their programs, which is arguably as important to know as the program outcomes. Any practical obstacles associated with integrating the program in schools were also not described.

In summary, there is growing empirical support for school-based education programs targeting students in Grades 4–6 (i.e., ages 8–12 years) in the context of East Asian countries (Vondráčková & Gabrhelík, 2016). Fig. 8.1 presents an example of a school-based program administered in a study by Mun and Lee (2015). A guiding principle of their program was that young people develop a reliance on gaming and other online activities as a way of dealing with stress. The program assumes that gaming is a coping strategy that develops into a habitual pattern with prolonged use. The aim is to help participants gain control over behavior and cope with stress in new ways. This is achieved by critical reflection on the emotional function of their electronic media use, learn new coping skills to replace media use, and strengthening real-world social relationships to reduce reliance on online social interactions.

Examining technological measures

Preventative education can be limited because it often requires participants to have some insight and be engaged to be truly effective. An alternative approach is to modify gaming technology itself to protect vulnerable users. Some novel preliminary studies have examined the behavioral effects of modifications to gaming devices and other digital technology. For example, a study by Lee et al. (2014) examined a smartphone usage tracking system which encouraged users to reduce their smartphone use. A similar type of study by Davies and Blake (2016) investigated the effectiveness of a timer-based automatic shutdown system. This experiment provided a controlled method of assessing similarly designed systems implemented in South Korea to curb game play among adolescents.

Swapping out the digital technologies for an analogue option may be helpful for some users. A simple but interesting study by Montag et al. (2015) examined whether wearing a watch might reduce incidental smartphone use. Watch-wearers reported significantly less smartphone use, demonstrating that device-bound habits can be modified by redirecting antecedent behavior. Emerging research studies of this kind demonstrate the potential of technical measures, particularly in terms of offering an in situ response to problematic use.

Time	Subject	Provision of information	Interventions for empowerment	Behavioral modification methods
1	Knowing the Internet correctly	Orientation Game for self-introduction	Forming teams Identifying the problems and exploring solutions	Making an agreement for behavioral change
2	Exploring life change from the Internet	The good and bad of the Internet Harmfulness of Internet addiction	Making a newspaper about the prevention of Internet addiction	Reinforcement with rewards for active participation
3	Doing self-control	Methods for prevention of Internet addiction Methods of controlling Internet use	Making active interaction and support in exploring and choosing methods for controlling Internet use	Setting behavioral goals Reinforcement with rewards for active participation
4	Doing self -understanding	Features of Internet addiction	Finding strengths of mine Writing a letter to me	Practice of self-control: Self-observation Reinforcement with rewards for active participation
5	Controlling stress	What is stress? Stress about using the Internet	Finding methods for managing stress	Practice of self-control: Relaxation technique Reinforcement with rewards for active participation
6	Calming one's self	Communication methods My roles for a society of no Internet addiction	Communicating emotions effectively	Practice of self-control: Relaxation technique Reinforcement with rewards for active participation
7	Improving interpersonal relationships		Improving on and off-line interpersonal relationship	Practice of self-control: Assertiveness training Reinforcement with rewards for active participation
8	Challenges for future dreams		Making my business card Interview with future me Sharing experiences of the program with members	Awarding certificates

Fig. 8.1 An example of school-based education for Internet addiction (Mun & Lee, 2015).

The policy response: The role of the authorities

While many therapeutic and psychoeducation approaches tend to focus upon individuals, most prevention and harm minimization frameworks emphasize the important role to be played by broader institutions and authorities. Indeed, as countries become more actively involved and coordinated in developing responses to problematic gaming, it becomes increasingly important for research to provide evidence to help inform potential developments in policy and practice. It is a fair characterization of the area to argue that statements on policy have been relatively light on detail in research studies, principally because researchers have tended to be preoccupied with theoretical discussion rather than broader practical implications. Despite this, there have nevertheless been some studies that have recommended the recognition of problematic gaming as a public health threat in policies and the need for inclusion of all relevant stakeholders in developing prevention measures.

Studies evaluating school-based programs have generally concluded that these programs are worthwhile, but that they should be delivered at the earliest possible age (i.e., 8–10 years). Some researchers further recommend that programs are supported by school staff, including teachers, rather than being externally operated to ensure the smooth operation and viability of the program. Active school involvement may ensure the provision of adequate resources and face-to-face time with students. Similarly, stakeholders, such as parents, hospitals, youth mental health services, and churches (or other institutions responsible for spiritual well-being) should be consulted in the decision-making, development, and administration of programs.

Another important consideration within such discussions has been recognition of the role and rights of the young person in policy development (King & Delfabbro, 2017). Consistent with broader international principles relating to the rights of children, client-centered practice, and nationally mandated ethical standards for research, attempts should be made to consult young people about the design and format of prevention programs and how they can become active participants in programs. Policies may support this by requiring that programs are administered in small group formats, with interactive components, and give ample opportunities for group discussion and projects. For example, students working in groups to design features for a game that might promote more responsible or healthy use.

Researchers have proposed that programs should focus on creating social norms for gaming rather than trying to challenge individuals' views. Program content should be balanced in terms of acknowledging the positive and negative aspects of gaming. Because gaming is not equivalent to drug-taking, programs should avoid adopting any popularized slogans used in drug education. "Empowerment" has been a theme in programs, referring to the notion that young people are more likely to make positive changes when they feel responsible for the change, as opposed to being "forced" to make changes. Along a similar theme, programs should try to avoid notions of problem gamers as "victims" or similar characterizations that may become internalized by young people. Such labels may not be beneficial to broader aims. Instead, programs should consider having a practical emphasis on skills and problem-solving (i.e., abilities) to address problems, at least in the beginning, rather than draw on concepts like "self" and "identity" which may reinforce a view of problems being fused with fixed traits.

Prevention studies have consistently called for greater recognition of Internet and gaming addictions in national health policies (Yang & Oh, 2007). Researchers have recommended increasing funding for school-based programs and epidemiological studies to assess the health impacts of digital technologies, while acknowledging the competition for time and resources in schools. Some researchers have recommended that universal prevention measures should be expanded given their greater cost-effectiveness compared to treatment (Koo, 2013), noting that even brief programs yield positive outcomes (Deng et al., 2013). The two populations seen to be of highest priority for selective prevention are elementary school-aged children (i.e., those aged 8–12 years) and parents (Lee, 2012). This is based on reasoning that preadolescent children are still beginning to learn to use the Internet and online games (i.e., they are less likely to be established or habitual users), and parents tend to have more insight and control over gaming behaviors in children and are usually more cooperative than adolescents.

Walther et al. (2014) has argued that health policies should reflect the changing social norms for digital technology use. Current epidemiological data are needed to understand the nature of normative and low-impact use of electronic devices, as the basis for national guidelines on healthy and normal use. These data assist in identifying at-risk users. In regard to policies that prohibit gaming products, Davies and Blake (2016) argued that "shutdown laws" (i.e., laws mandating the discontinuation of online services for adolescents at certain times) should be reviewed carefully, because such laws may be ineffective or counterproductive.

Other evidence suggests that the shutdown law in South Korea may have some modest beneficial effects (Lee, Kim, & Hong, 2017). The authors argued that the gaming industry should be more accountable for its products and services, because the industry has "power over gamers" (p. 56). Industry responsibility is difficult to define in the case of gaming, but may involve developing some player welfare and harm minimization strategies.

Some lessons from steps taken by the gambling industry (see Blaszczynski, Ladouceur, & Shaffer, 2004) may be applicable in some regions. One proposal suggests that the gaming industry should inform consumers of the known risks of problematic gaming and take reasonable steps to provide information about customer care and referral services (van Rooij, Meerkerk, Schoenmakers, Griffiths, & Van De Mheen, 2010). Another option may be to offer gamers the option to self-exclude temporarily or permanently from online games and game-related online services (Király, Griffiths, et al., 2017; Király, Tóth, Urbán, Demetrovics, & Maraz, 2017).

The role of parents

A common refrain from outside observers of problematic gaming is that parents should simply remove or turn off gaming devices and disconnect the Internet service (i.e., the "*just turn it off*" approach). To be fair, this approach will usually be effective in some cases of problematic gaming, such as when problems are minor, the user is younger, and the parent or carer has a history of successfully establishing boundaries. However, in some other cases, the sudden removal of gaming devices by a parent or carer may result in relational conflict with the risk of physical retaliation and violence.

We are aware of some (very rare) cases where adolescents have left the family home following the confiscation of a gaming device, including a case of a teenager becoming homeless and playing games at a local Internet café for over 12 months before returning home. There are also documented media cases of young people who have committed violent acts as a result of the removal of gaming devices. Removing game devices from a pathological player denies some of the opportunities to play, but it does not remove or alter the underlying psychopathology (Lee, 2012). These individuals will still have a strong desire to play and impaired control over gaming behavior.

Research studies on parental restriction and monitoring of gaming have generally produced mixed findings concerning the effectiveness of these methods in curbing problematic behavior (Choo, Sim, Liau, Gentile, & Khoo, 2015; Kwon, Chung, & Lee, 2011; Liau et al., 2015; Rehbein & Baier, 2013). However, such inconsistent findings may be related to difficulties in isolating the influence of a single variable on problem gaming behavior. Adolescents from single-parent families, for example, have been found to be at greater risk of problem gaming, but the reasons for this may be multidimensional (e.g., single-parent families have various socioeconomic attributes). In terms of parenting factors, the research evidence suggests that a secure parent-child relationship may be the most important protective factor for IGD, with this variable being more important than media-monitoring practices (Schneider, King, & Delfabbro, 2017).

Studies indicate that the effectiveness of restriction may depend on whether it was implemented *before* or *after* the gaming problem began. In support of this view, Wu et al. (2016) reported the results of a longitudinal study of 2021 adolescents, which showed that media restriction was nearly twice as high for adolescents who used the Internet excessively compared to other adolescents. Restriction may, therefore, have a "forbidden fruit" effect (see Bijvank, Konijn, Bushman, & Roelofsma, 2009), meaning that gaming becomes more desirable when unavailable. Removing devices also denies children opportunities to learn to self-regulate gaming.

Although parental restriction of gaming activities will be necessary in practice, particularly for children, parents should not rely on this approach as the primary means of protecting against overuse. It will likely become less effective as the child gets older. The effectiveness of media restriction is influenced by other individual and contextual factors. The greater use of restriction may be a sign of the need for alternative approaches. Parents who encourage alternative interests, self-regulation, and problem-solving may be more successful in restricting gaming activities. Children who can stay calm and reflect on their actions, who have multiple hobbies, will likely not need to be told "no" as often as other children, and thus will be less likely to develop gaming problems.

What parents should know

Recognizing that not all parents can (or wish to) remove gaming devices to prevent the occurrence of gaming misuse, some health organizations and expert bodies (Dooley, Cross, Hearn, & Treyvaud, 2009; Lim, 2012; McLean, 2013; RANZCP, 2011; World

Health Organization, 2015) have developed guidelines to assist parents to make more informed decisions about gaming activities in the home environment. Together, these guidelines suggest that parents should:

(1) learn about the types of games available on the market and the gaming preferences of their children to determine the suitability of game products;
(2) model healthy use of electronic media and avoid enabling excessive use;
(3) know the warning signs of problematic gaming, such as mood changes (e.g., the child is only happy when gaming), loss of sleep due to gaming, diminished interest in other activities, and lying about gaming and refusal to stop playing when asked;
(4) set limits on gaming time in advance and encourage playing games as a family activity;
(5) be familiar with who the child or adolescent plays with online and ensure that personal information is not shared with strangers by discussing cyber-safety;
(6) negotiate how gaming devices are used and then employ the parental controls on gaming consoles (e.g., content restriction and time limits) and lock the option to spend money on games using credit cards and similar options;
(7) support other interests and activities, especially non-screen-based activities such as sports or physical exercise.

Parents may also benefit from consulting independent nonprofit websites (e.g., www.commonsensemedia.org) that provide objective descriptive information on the content and play experiences of new release and popular games. These sites can inform purchasing considerations by detailing whether a game is: (1) online-enabled; (2) can be "completed"; and (3) has age-appropriate content. These sites have forums where parents can ask questions about gaming products such as their "addictiveness" (acknowledging this may be quite subjective) and suitability for children of different ages.

This information may supplement consumer advice from age classification systems (e.g., the ESRB and PEGI rating systems), which explain content briefly, but do not provide details on online connectivity (e.g., the extent to which a game requires the player to play with others) or the average time required to finish a game (comparable to a film's running time). Some games have publicly available online statistics, such as how much time the average player spends playing each week or requires to finish the game, which may help parents judge a game's time commitment and potential for overuse.

Parents should be informed that gaming behavior that tends to be irregular (e.g., not daily) and begins later in life will tend to be less likely to develop into a problematic behavioral pattern. The types of gaming activity is also an important influence on behavior. Studies have shown that some online games (e.g., Massively Multiplayer Online [MMO] games, and games that include MMO elements) are more difficult for young people to regulate use and can have more negative impacts than other games on school performance, including reading and writing skills (Smyth, 2007; Weis & Cerankosky, 2010). The availability of "riskier" games should, therefore, be controlled, such as scheduling play during school holidays or similar periods.

Parents concerned by a child's gaming should take a screening test. Such tests are available online from regional organizations, such as the Network for Internet Investigation and Research Australia (NIIRA) in Australia, and from online service

providers (e.g., www.netaddiction.com). Chapter 5 discusses IGD screening in more detail and provides a list of recommended measures. Screening tests are *not* diagnostic and will not account for other factors, but can be a useful starting point. Parents should consult their doctor to discuss concerns and seek referral to a mental health service or practitioner in the area, if required.

Current regulatory approaches

Gaming products are mostly freely available products across developed regions around the world. Standard regulations on gaming products pertain to sale restrictions on games with mature content for underage players. Gaming products sold in retail stores and on some online stores are typically required to include health-related warnings in relation to photosensitivity (i.e., low risk of seizures during play) and pain or discomfort issues associated with prolonged use and sedentary behavior. Depending on region, gaming products are classified for sale by an independent body (e.g., the Office of Film and Literature Classification [OFLC] Board in Australia) or an industry body (e.g., the Entertainment and Software Rating Board [ESRB] in the United States) to receive a rating before being legally available for sale.

Ratings determine who is legally able to purchase a game (e.g., a R18+ rating prevents anyone younger than 18 years from purchasing the game) and are based on the "intensity" of the gaming experience (King & Delfabbro, 2010). Games that do not meet code standards will be refused classification (unless the game is revised as directed) and will be prohibited from commercial sale in that region. Ratings systems include recommendations for parental guidance or adult use only for some games, but they lack reference to specific game content or types of games with associated research evidence on links to misuse or IGD.

Regions in East Asia, particularly South Korea, have been more active in terms of regulation following social pressures and mass media attention on gaming-related harms. The international publicity on deaths in Internet cafés, irrespective of whether IGD was a causal factor, was a precursor to the country's implementation of major regulatory measures (Koh, 2015). Such measures included technical measures to curb use by minors. Similar measures that directly limit accessibility to gaming activities have not been considered in the West.

There was an informal proposal to limit Internet speeds in schools in Australia (i.e., broadband "throttling") to curb online activities by students, but this was not implemented (Joint Select Committee on Cyber-Safety, 2011). The main regulatory focus in Western countries in regard to online digital technologies has been cyber-safety, including cyberbullying, sexting, and illegal content sharing, rather than misuse of gaming products. A recent review by Király, Griffiths, et al. (2017) and Király, Tóth, et al., 2017 discussed some potential measures for consideration, such as increasing the price of games to reduce accessibility and a universal warning system in games that generates pop-up messages to warn users of overuse, but these measures have not been seriously considered.

Barriers to regulating devices

Regulation of gaming activities to address gaming overuse and IGD is complex for many reasons. First, the question of what constitutes healthy versus unhealthy use of games will depend a lot on the user. "Intense" gaming behaviors may not be at all problematic in some cases (Király, Griffiths, et al., 2017). Therefore, it may not be feasible to design "one size fits all" countermeasures. Even behavioral tracking data (i.e., objective information about gaming behavior logged by the game server), including how much time is spent gaming per session (including time where the player is "idle") and the amount of money spent on in-game purchases, may not provide a clear indication of resultant harm. A high threshold for misuse may be necessary to avoid false positive cases. As a result, it may take a long time before an individual will trigger a "red flag" on the system. This approach may, therefore, be more suited to retroactively identifying problematic users rather than emerging cases of misuse.

Another complication is many players will spend time and money across multiple devices (e.g., *Xbox, PlayStation, Nintendo* consoles, and/or a personal computer) and online services (e.g., *Steam, Xbox Live, PlayStation Network*), making it difficult to detect "multisystem" problematic users. The fact that a single gaming activity can occur on or require multiple networks and devices means that effective regulation and protective measures may require the cooperation of multiple industry parties, including those who would not normally view themselves as having responsibility for what users do with their product or service, or prefer to avoid any perception of responsibility (e.g., the Internet service provider).

As a related note, technical regulations can often have limited effectiveness for savvy users, just as antipiracy and copyright infringement measures have been easily defeated. Proposed and current technical gaming countermeasures (e.g., blocking accounts) are relatively easy to circumvent (e.g., by creating a new account), rendering them more symbolic measures of protection, like a knee-high wall that can be easily stepped over.

Transparency and ethical game design

Other regulations could be implemented that require greater transparency about game design, such as in relation to rewards for time or money spent in the game. While information alone may have a limited effect on problematic use, it may still assist players in making more informed choices about gaming products. For example, when Electronic Arts announced that certain rewards in the game *Star Wars: Battlefront II* would require 40 h of play to earn, many players online declared that the game was exploitative and that they would not play it. As another example, in the game *Overwatch,* players can purchase a "loot crate" using real money which contains a random assortment of in-game items of varying rarity (i.e., in-game contextual value). The developer was required by the Chinese government to disclose the probability of specific items "dropping" in a purchased loot crate, to inform players about "the odds" of winning and thereby attempt to reduce excessive spending on crates (Frank, 2017).

Such measures may be comparable to the regulatory approach to electronic gambling machines, where gamblers are informed of the negative long-term return to the player. Such approaches might eventually lead to new regulations on the conditions under which game items can be sold and advertised. In addition, game developers may have to consider more "ethical" approaches to game design, in the sense of giving the player more awareness of what the gaming product contains and what may be involved to complete it. Such considerations would likely need to be balanced against the developers' creative demands for novelty and surprise.

Prevention in action: Regional case examples

South Korea

South Korea has developed a highly coordinated system to respond to the region's high prevalence of gaming and Internet-related problems (Koh, 2015; Ministry of Science, ICT, & Future Planning, 2016). This region is unique in that its government has been at the forefront of prevention efforts (Koo, Wati, Lee, & Oh, 2011), particularly in contrast to the United States, Western Europe, and Oceania, where private services and nonprofit organizations are the primary stakeholders for prevention.

South Korea has eight ministries responsible for its disordered gaming and Internet use agenda, including (but not limited to): (1) the Ministry of Science, ICT and Future Planning, which is responsible for the oversight and strategic development of national responses to the problem; (2) the Ministry of Culture, Sports and Tourism, which oversees interventions specifically for Internet gaming problems according to the "Game Industry Promotion Act," including awareness campaigns, survey investigations, literacy and training programs, and hospital care; (3) the Ministry of Gender Equality and Family, which oversees youth protection according to the "Juvenile Protection Act," including establishment of youth counseling centers and residential schools for short-term care; (4) the Ministry of Health and Welfare, which conducts medical research and oversees more than 200 mental health clinics countrywide; and (5) the Ministry of Education, which oversees school-based prevention projects.

Another important agency is the National Information Society Agency (NIA), which plans and executes policies to support the work of the Ministry of Science, ICT and Future Planning. With its budgets and projects ratified by the National Assembly, the NIA opened the Internet Addiction Prevention Center (IAPC) in 2002 and has established Internet addiction centers across 13 regional governments. Similarly, the Ministry of Gender Equality and Family established the Korea Youth Counseling and Welfare Institute, which provides prevention services for IA to complement its counseling services for youth problems including mood disorders, adjustment difficulties, and family conflict issues.

The IAPC offers Internet abstinence rehabilitation camps through the National Center for Youth Internet Addiction Treatment (NYIT). Besides these tertiary level initiatives, there have been numerous universal prevention measures, such as public

education to promote healthy online gaming culture. Several agencies including the Korea Education and Research Information Service (KERIS, comprising 178 Wee Centers national wide) and Seoul Metropolitan Government (including six "I Will" Centers in Seoul City) work together to promote healthy online behavior.

China

A defining feature of China's legislative approach to gaming problems has been its selective restriction and censorship of Internet gaming activities. For example, from 2000 to 2014, foreign gaming consoles, such as the Sony *PlayStation* system, were banned from commercial sale in China. In 2007, the Ministry of Culture (MoC) was responsible for the implementation of the Online Game Anti-Addiction System (OGAAS). This system requires all Internet game service developers to collect age-verification data and monitor individuals' usage. Individuals under the age of 18 years are restricted from playing online games for more than 3 h a day, with longer play resulting in automatic deactivation or compromised in-game rewards (i.e., "fatigue system"). In compliance with the OGAAS, players are required to log in using their verified ID.

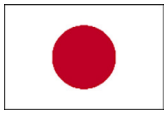
In April 2011, the Ministry of Culture implemented the Interim Provisions on the Administration of Internet Culture, as a means of gaining more control over Internet-based services. Under these regulations, online games (and any online products) are not permitted to include gambling, pornography, or violence, or any content considered to erode social morals or violate laws. The regulations also forbid underage players from purchasing virtual currency in online games. However, many have argued that the system is compromised by loopholes such as creating alternative accounts (Zhan & Chan, 2012).

China's commitment to prevention of gaming and Internet-related disorders has been enshrined in numerous legislations, including: (1) *Protection of Minors Act* (revised 2006), article 33: The State adopts measures to prevent the minors from internet addiction, encourages research and development of internet products which are conducive to the healthy growth of minors, and promotes the use of new technologies for preventing minors from Internet addiction and (2) *Regulations on the Administration of Business Sites of Internet Access Service* (revised 2011), article 9: No business site of Internet access services may be set up within 200 m around the campus of any secondary or elementary schools.

One example of universal prevention in China was the "Be NetWise" campaign launched in Hong Kong in 2009. This campaign involved over 1000 educational talks and training workshops for more than 150,000 students, parents, teachers, and social workers, and over 88,000 home visits. Over 50,000 counseling sessions were provided through the "Be NetWise" Family Support Center, and an exhibition bus touring visited over 300 schools and public locations, attracting some 22,000 visitors. Over 100,000 copies of a handbook on Internet usage were distributed to parents, and a professional education resource kit was provided to all primary and secondary schools for teachers and social workers. There have also been large-scale school-based prevention programs that include problematic gaming in their modules, such as the P.A.T.H.S. program (see Busiol & Lee, 2015).

The Ministry of Culture proposed the Comprehensive Prevention Program Plan for Minors' Online Gaming Addition in 2013 with the aim of conducting research on prevalence of problematic gaming and Internet use and developing diagnostic tools and intervention models. Central and local governments have funded independent research undertaken by various institutes, such as the National Key Laboratory of Cognitive Neuroscience and Learning at Beijing Normal University and the School of Public Health and Primary Care at the Chinese University of Hong Kong, to investigate the prevalence of IA across multiple regions in China (Li, 2013; Li, Zhang, Lu, Zhang, & Wang, 2014; Mak et al., 2014; Wang, Wu, & Lau, 2016). Online gaming addiction is a recognized disorder in mainland China, and affected individuals can obtain treatment at specialist outpatient clinics in public hospitals. Private hospitals, NGOs, and private practitioners also provide services for these individuals.

Japan



The Japanese government has three ministries whose portfolios relate to hazardous and disordered Internet use, including: (1) the Ministry of Internal Affairs and Communications (MIC), which oversees regulations for Internet use in general; (2) the Ministry of Health, Labor and Welfare, which is responsible for health and prevention initiatives related to Internet use; and (3) the Ministry of Education, Culture, Sports, Science and Technology (MEXT), which oversees prevention measures for hazardous Internet use among school-age children.

The Japanese government recognizes both Internet use and content as potentially "harmful" under certain conditions, particularly for young populations. To combat these issues, the *Act on Development of an Environment that Provides Safe and Secure Internet Use for Young People* (Act No. 79 of 2008) establishes the following service-related provisions: (1) increase public awareness and education on appropriate Internet use; (2) introduction of legal obligations for Internet service providers to provide a filter service; and (3) support for private organizations (e.g., NGOs) to teach young people skills for appropriate Internet use.

In 2012, the MIC launched an education-based initiative involving lectures and training resources to increase digital literacy and knowledge of Internet misuse. In 2014, the MEXT launched the "IT moral developing project for children" which raised awareness of hazardous Internet use, particularly in relation to smartphone use. Since 2014, the Japan Internet Safety Promotion Association (JISPA), a nonprofit organization that receives government funding, has conducted campaigns that teach safe Internet use to children. The campaign also targets parents and involves lectures and promotion of Internet filtering and monitoring.

The MEXT launched a clinical trial for IA for young people in 2014, which includes an outdoor program overseen by the National Institution for Youth Education in collaboration with the Kurihama Medical and Addiction Center (Higuchi et al., 2017).

Germany

Germany has had an increasing number of referrals for disordered gaming to its addiction treatment centers over the past decade (Dau, Hoffman, & Banger, 2015). This has been challenging for treatment providers because a service for these problems could only be provided if it had also presented with an eligible comorbid disorder (e.g., depression, substance use), due to gaming disorder having no official psychiatric status. However, in 2012, the Federal Ministry of Health updated its drug and addiction policy to outline new initiatives for Internet-related disorders. The primary recommendation was to support the process of adopting a gaming disorder category in line with the ICD-11.

The Ministry's policy report also outlined the provision of: (1) further training and qualification of teachers and professionals in the field of parental and family counseling; (2) education for parents about possible risks of online activities, including technological measures (e.g., parental locks); (3) improved protection of children and young people in relation to online games; (4) criteria to identify risky and pathological Internet use and adopting these criteria in rating systems for Internet games; and (5) diagnostic instruments for Internet and gaming addiction for use in treatment settings (Drug Commissioner, 2012).

Germany has a range of public services for addiction treatment, in addition to self-help and support services. There are numerous websites in the field of addiction support, which provide information, self-report tests, consultation via webchats and email support, and self-help interventions. There are several university institutions engaged in treatment and prevention research in this area, which are currently investigating, for example, selective prevention programs in schools (Dreier, Wölfling, Beutel, & Müller, 2015). A professional association for Internet addiction has been established ("Fachverband Medienabhängigkeit e.V." or Media Addiction Association) and the German Association for Psychiatry, Psychotherapy, and Psychosomatics (Deutsche Gesellschaft für Psychiatrie, Psychosomatik und Nervenheilkunde) has founded a group for the investigation and classification of Internet-related problems. In addition, the German Federal Parliament's Office for Technology-Outcome Assessment (Büro für Technikfolgen-Abschätzung) advises the Parliament and its committees regarding questions concerning technological and social change, including questions on new electronic media and behavioral addictions (Evers-Wölk, Opielka, & Sonk, 2016).

Outpatient treatment centers have been established in Germany over the past decade. The Schwerin Media Addiction Counseling center for "excessive media use and media addiction" was established in 2006 as a joint project between the Mecklenburg-Vorpommern Evangelical Addiction Help and the Schwerin Helios medical centers. The Computer Game Addiction Outpatient Clinic of the University Hospital in Mainz was opened in 2008. The service offers cognitive-behavioral therapy in manualized individual and group formats and provides free telephone support for friends and families of clients. Another service is the independent consulting and treatment service for media dependency in the outpatient clinic of the Department of Addictions and Psychotherapy, at the LVR Clinic in Bonn, which was established in 2009 and has yielded positive treatment outcomes based on published work.

The United States, the United Kingdom, and Australia



The United States, the United Kingdom, and Australia have much in common with respect to their national approaches to gaming disorder prevention and treatment. All three regions do not currently recognize gaming disorder as a legitimate disorder, in line with the preliminary status of IGD in the DSM-5. This lack of recognition has impeded access to treatment via health insurance schemes in the United States, in particular. These regions' health policies do not make reference to gaming or Internet-related disorders (Dooley et al., 2009; Joint Select Committee, 2011), but have recognized excessive screen time as a health hazard, usually under an umbrella term like "sedentary behavior."

In the United Kingdom, gaming or Internet-based disorders are not recognized by the National Institute for Health and Care Excellence (NICE), but section 1.6.3 of its guidelines for obesity (CG189) refers to reducing "using a computer or playing video games." Some other guidelines and policy recommendations for addressing Internet use have been developed in the United States, such as the American Academy of Pediatrics' (2011) position statement on screen time for children. This statement includes recommendations for the United States to adopt a prevention model comparable to those in East Asia, such as implementing mandatory media education into school curricula.

Another feature of these regions is that their governments have not widely funded specialized gaming or other Internet-related disorder treatment services, but have provided funding to nonprofit organizations for universal and secondary prevention. As one exception in the case of treatment, an unfunded pilot program in London, at the Centre for Compulsive and Addictive Behaviors, was operated for a 3-year period, but then was terminated indefinitely. The National Health Service (NHS), the publicly funded healthcare system in the United Kingdom, refers to Internet addiction on its homepage and offers information on referrals to various addiction treatment centers (e.g., hospitals and outpatient treatment centers).

In the United States and Australia, there are numerous private providers (e.g., the reSTART Internet Addiction Recovery Program in Seattle), including online-based psychological practices (e.g., www.netaddiction.com in the United States, established by Dr. Kimberly Young) and independent residential programs. These regions also have a large network of independent councils and international societies dedicated to educating parents and users about risks related to gaming and Internet use, often with a focus on other online risks (e.g., cyber-safety).

Several organizations in the United Kingdom collaborate across national government, industry, law, academia, and charity sectors to help keep children safe online, including (1) the UK Council for Child Internet Safety (UKCCIS); (2) National Society for the Prevention of Cruelty to Children; (3) UK Safer Internet Centre; and (4) Childnet International. In the United States, there are similar private, nonprofit organizations including the National Center for Missing and Exploited Children (NCMEC) and the Family Online Safety Institute. Collectively, these bodies provide parenting

resources on Internet use and have a strong focus on supporting law enforcement in tackling illegal online activities involving children.

The bulk of research into treatment and prevention in these regions is generally undertaken by university institutions. Competitive funding opportunities for gaming or Internet-related research appear to be limited, which has negatively affected the overall scope and quality of the research base and its compliance with international standards for health and clinical research (King, Delfabbro, Griffiths, & Gradisar, 2011; King, Delfabbro, Wu, et al., 2017). Australia's leading expert body for health and medical research, the National Health and Medical Research Council (NHMRC), has not funded a project on gaming disorder or Internet addiction in its history.

The primary Australian governmental body concerned with gaming and Internet-related issues is the Australian Communications and Media Authority (ACMA). The ACMA is an independent statutory authority tasked with ensuring media and communications legislation operates in the public interest. The ACMA has acknowledged excessive gaming and Internet use and provided parenting resources and supported epidemiological research.

What governments should consider

Some governments are beginning to recognize problem gaming as an issue of increasing priority. Where should they begin to tackle this issue, and what areas should be prioritized? Based on the experiences of countries where prevention efforts are more developed than other countries, including South Korea and Germany, the first step appears to be the *formal acknowledgment of IGD* as a legitimate social and health concern.

The acknowledgment of IGD may include: (1) governmental support for the IGD classification in the DSM-5; (2) the discussion of problem gaming and IGD issues within relevant governmental forums and councils (e.g., in Australia, the *Council of Australian Governments*); and (3) recognizing "gaming disorder" within national addiction policy and health research priorities alongside gambling disorder, to enable more coordinated efforts in areas of research and intervention. This may lead to practical outcomes such as the inclusion of IGD-related questions in national epidemiological health studies of young people.

State governments should consider the provision of support for *prevention campaigns and resources*, such as school-based programs for young people (and particularly males) within the 10- to 12-year-old category (i.e., the age at which gaming appears to become a routine activity) as well as older users at risk of developing significant gaming problems (i.e., 15–17 years). Overseas programs may offer lessons in best practice for these measures, taking into account the relevant cultural factors and gaming-specific environments. These programs should be designed to complement any existing digital health programs about managing screen time and appropriate use of online technologies. This may ensure that discussion of problem gaming occurs alongside other priority areas including cyber-safety, "sexting," and privacy issues.

Fact sheets and resources (including online materials) on IGD and its treatment options in mental health and medical settings would be helpful in regions where this information is lacking.

Educating the general public about problem gaming and IGD should be another priority. An important consideration is avoiding simplistic representations (e.g., overemphasizing time spent playing without acknowledging the important features of misuse or the disorder). Normal gaming should not be pathologized. Clear and concise descriptions of problem gaming based on scientific models should be used (i.e., references to "*loss of control*" and "*negative impacts of gaming*"). Screening instruments for problem gaming and IGD should be more accessible and translatable to a general audience, such as in the form of an app or a website. This would enable individuals to monitor their gaming or the gaming of others, with the potential option of tailored and normative feedback about gaming patterns. Example feedback may include "*You have played 20 h this week, which is about the same as 30% of the population*."

Governments should consider *consumer protection measures for gaming products*, such as information for parents about online games such as MMOs (e.g., *World of Warcraft*) and practical strategies for preventing problem gaming at home. Game classification systems lack reference to "addictive" features (e.g., persistent online worlds, social requirements, and time-consuming activities). Simple but direct information such as "This game is *never-ending* and can interfere with school, work, and socializing" may be more informative than "This game contains fantasy violence". Additional information would include the anticipated time required to finish a game (e.g., 10–15 h).

Another protection measure that could be government-regulated is the *transparency of monetized reward systems* in online games, particularly games with random reward features (e.g., "loot boxes") that cost money. Players of these games should be informed of the odds of obtaining certain virtual goods in any given transaction, for example, so that they can make more informed decisions about games in which they spend money. Players should also be entitled to *refunds* on games purchased digitally and virtual goods purchased in games.

Not all proposed and currently implemented measures may be viable or cost-effective in all regions. Technological measures such as "shutdown" measures, blocking software, and similar restrictions for teenage users may *not* be effective given the existence of workarounds and limited empirical support at this stage. Time limits could still be implemented in gaming cafés. Raising the price of games sold locally is *unlikely* to reduce problem gaming given the global supply chain (Király, Tóth, et al., 2017).

Harm reduction strategies

Harm reduction strategies are informed by a public health approach that views gaming as a health behavior (rather than an addiction per se) where gaming is safe at certain low to moderate levels, but can become incrementally harmful with increasing use. Addictions require a lifelong commitment to self-management, rather than a "once

off" intervention. The main purpose of harm reduction is to reduce the negative consequences associated with excessive use, by taking practical steps to address the conditions of use and the use itself.

In clinical practice, the harm reduction approach may help to achieve small gains that boost the client's confidence in themselves and in the therapeutic alliance. Strategies and ideas are ideally conveyed in nonjudgmental and noncoercive ways (i.e., "*Some people have found these tips to be useful…*" rather than "*You should try these tips…*") to empower the client to be the primary agent of change. Some example strategies include:

Environmental modifications

Gaming activities usually take place in the home. Therefore, the client should make changes to the home environment to reduce the ease or accessibility of use, or reducing the likelihood of long gaming sessions. This includes shifting living room furniture so that it is not facing the gaming device, removing gaming devices from the bedroom, and keeping gaming paraphernalia to a minimum or to a single room in the house. The client could also keep gaming equipment unplugged and stored away in a box when not in use to increase the effort required to initiate a gaming session. On a note related to accessibility of gaming opportunities, if the client tends to play games at a local internet café or LAN gaming café, then it may be advised that the client take steps to avoid these locations, for example, by taking a different route to work or other locations.

Limit-setting

This approach involves setting a time-limit on a gaming device by accessing the parental lock controls on a gaming system (e.g., *PlayStation*, *Xbox* consoles), or setting alarms that signal a break in play (e.g., 5-min break every 30 min), or scheduling gaming at times when it is more likely to end at the intended time due to external interruption. These strategies aim to give gaming activities an endpoint, given that many types of games are essentially endless. Another strategy would involve the client learning how to excuse himself or resist invitations to keep playing in social online games (e.g., assertiveness training) to adhere to intended gaming limits when playing with others. While it may be possible for the client to give a "third party" control of internet and game account logins (i.e., akin to "cash control" strategies in gambling), this approach may be best suited to parents managing an adolescent with IGD under conditions agreed upon by all parties to minimize conflict. This may be ineffective or counterproductive in couples, because having one partner in charge of the other's gaming time may create resentment and conflict (Hawkins & Hertlein, 2013).

Increase reality awareness/reduce gaming immersion

Gaming is a highly immersive activity. Gaming activities can be like casinos for gamblers in the sense that there are often almost no indicators of the real world during the activity (e.g., the absence of clocks and windows in casinos). A "reality awareness"

approach refers to strategies that reduce gaming immersion that contributes to experiences of losing track of time. Practical ideas include keeping the lights on in the room where gaming occurs, having a clock above the gaming screen, having an outside window in the field of view when gaming, having a mirror that enables the individual to see himself (i.e., to elicit self-awareness), and playing the game with lower audio volume or without use of noise-canceling headphones.

Buddy system

Social support may be more effective when positioned in the context of active gaming. This strategy involves the client making a commitment to play games exclusively with a responsible friend who agrees to play to a specific schedule with the individual. Games with a required cooperative element (i.e., not suited to solo playing) may be best suited for this plan. The goal is to reduce unregulated online play with rotating groups of online "strangers," which may help prevent the occurrence of long gaming sessions and the creation of multiple networks with associated incentives or commitments to play. Another aim of this strategy is to recalibrate the individual with IGD to the social norms and experiences of low to moderate gaming (i.e., how casual players think and feel about games). This may help shift the focus to "fun," rather than motives of "achievement" or "keeping up with others."

Build social connections

Problematic gamers often lose touch with people in their life who do not play games, including close family members. Therefore, strengthening the client's social relationships outside of online gaming circles may be beneficial to recovery and redirection to other activities. Many individuals with IGD may claim that they have few close friends outside of gaming or have friends that they have not been in contact with for some time. The aim is to "reconnect" with these friends and acquaintances or to make new friends by joining a social club (e.g., recreational and sporting groups). For adolescents with limited social skills and/or socioeconomic disadvantages, this might be facilitated by an older adolescent mentor in the context of a youth psychosocial rehabilitation service. If the client is socially anxious, then this strategy may be supported by cognitive-behavioral strategies to reduce the client's fears concerning non-gaming social interaction.

Neurovegetative changes

This approach refers to introducing gradual changes to diet, sleep, and exercise to improve general health and energy levels. This may be performed in consultation with a doctor, sleep specialist, and/or nutritionist if there are specific concerns. Basic changes may include setting a consistent time out of bed (e.g., 7 am) followed by going outside for sunlight exposure (i.e., setting body clock), limiting caffeine to certain amounts (e.g., no more than 3 standard cups of coffee) and times of the day (e.g., no caffeine

after dinner), and introducing light physical exercise (e.g., walking for 30 min per day) and improving sleep hygiene and sleep scheduling (King, Delfabbro, Zwaans, & Kaptsis, 2014).

Valued activities

This strategy aims to explore the client's value system to identify new non-gaming activities that may be meaningful for the client. For example, if the client reports to value "adventure" and "challenge," then this might lead to identifying non-gaming activities that are consistent with these values such as rock-climbing, bike-riding, or martial arts. Volunteering may be a good option if no other preferences are forthcoming. Participation in new activities should be supported by a family member or mentor.

Avoiding risky games

Research has shown that certain games or gaming conditions may be more likely to lead to preoccupation and planning, and longer sessions of gaming. A study by Smyth (2007), for example, demonstrated that non-gaming individuals randomly assigned to play MMO games for one month experienced greater life interference than individuals who played other types of games. Avoiding massively multiplayer online (MMO) games (e.g., *World of Warcraft)* and other competitive online games (e.g., battle arena and battle royale games, first-person shooters) and the deletion of apps and shortcuts on supporting devices (e.g., smartphones, stored website links) linked to these games may be a helpful step toward achieving moderate levels of gaming. Players of MMO games who do not quit these games completely may consider reducing the number of active accounts or characters to reduce incentives or opportunities to play and the need to maintain progress evenly across these accounts. Another consideration might be avoiding playing certain game modes that tend to require much more time (e.g., "raids" and similar group-based activities in online games).

Finding closure in endless games

Many online games are essentially never-ending. While there may be a "level cap" (i.e., a number that indicates that the player has reached the pinnacle of advancement in the game), there are often uncountably many "horizontal" forms of progression (e.g., collecting gear with different looks or niche applications), as well as an endless number of activities that "refresh" regularly. Gaming behavior may be sustained because the player desires a sense of completion that may not be possible to realize.

Clients should be encouraged to identify ways of finding "closure" in games that they might otherwise play interminably. Some anecdotal evidence (i.e., self-reports of former problematic gamers) suggests that finding closure may require a kind of "ritual" or symbolic act of leaving the game. This may involve taking actions both in the game and in the real world. For example, the client could leave their game character in a specific location in an online game that has personal significance, which may be analogous, perhaps, to burying a deceased person in their favorite place. Alternatively, the

client may gift or delete the online character's possessions and deactivate the account and keep in its place a physical memento of the game that represents completion, such as a book on the game or a physical model of their avatar.

The perspectives of gamers

Gaming-related prevention measures will ultimately affect gamers (i.e., the consumers of the products and services), and therefore, their views on this issue should be consulted. Many members of the gaming community have shown a great willingness to participate in research studies and give feedback on topics related to problematic use of games (King, Delfabbro, & Griffiths, 2009). This is evidenced by the many dozens, if not hundreds, of studies (including many that are unpublished) that have recruited gaming populations online, usually with minimal or no incentive to participate.

In our experience, it has been feasible to recruit around 500 gamers from online communities for an online survey that requires 15–20 min, with minimal difficulty in obtaining permission from site administrators. Much of the feedback that we have received from these communities has been positive and constructive.

While gaming communities are largely composed of tech-savvy males aged 15–35 years who play the same types of game (i.e., competitive first-person shooters and strategy games), the term "gamer" itself does not convey much of unique meaning. Gamers have diverse views on and motivations for gaming—they are perhaps more heterogeneous in their views on games than, for example, individuals of a religious affiliation in their views on theological text. Some people may identify as being a gamer, but there is no collectively shared "*gamer view*."

Regular gamers are likely to have a range of views on the issue of prevention. While this group would be most directly affected by IGD prevention measures, there does not appear to be any evidence that this group has been consulted on this issue. This oversight is surprising given that many gamers will have unique and specialized knowledge of games, which may inform the development of education and consumer advice. They may be aware of the behavioral impact of "anti-IGD" measures incorporated into gaming products and services.

In 2017, we surveyed a group of 404 online gamers to collect their views on prevention and their support for various strategies. We provided participants with a list of potential measures along with explanations of how they might be implemented and asked them to rate their support for each measure. Fig. 8.2 provides a summary of participants' responses.

Overall, the participants were generally *favorable* toward most measures, particularly education and healthy guidelines for gaming. Measures that restricted gaming time or excluded the player from the game were supported by most of the sample (71%–78%), so long as these measures were voluntary or "opt in." Mandatory restrictions tended to be opposed, which paralleled the lack of support among Australian gamblers for a mandatory precommitment system for electronic gambling machines (Nower & Blaszczynski, 2010).

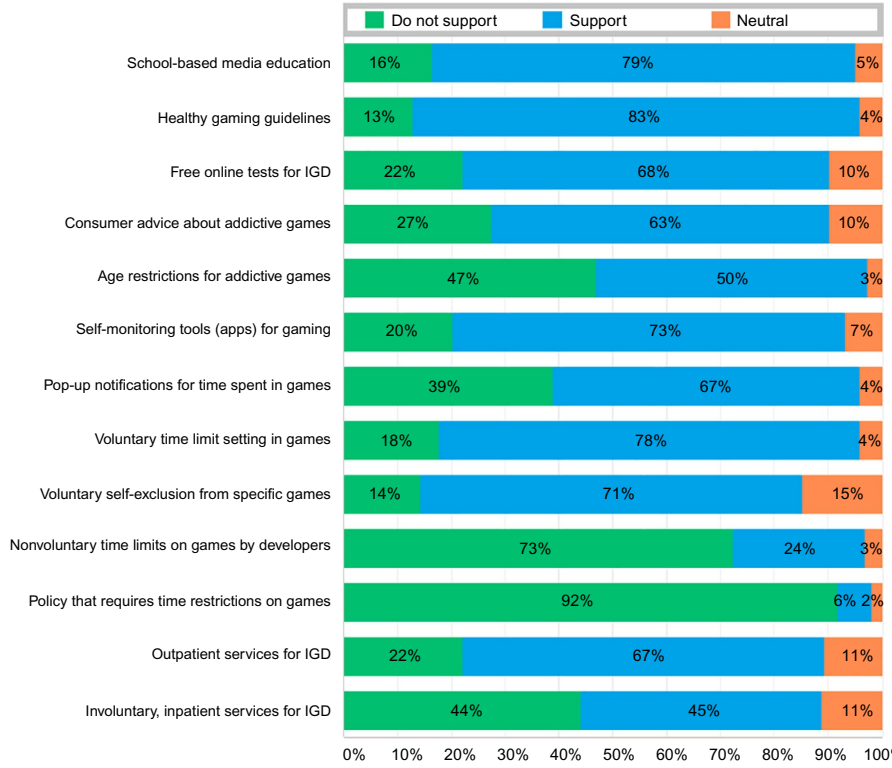


Fig. 8.2 Gamers' support for gaming-related prevention strategies.

Gamers' written feedback provided some additional insights. Many felt that technological measures designed to curb excessive gaming were likely to fail because experienced gamers tend to know (or can find out) ways of circumventing these measures. Systems that involve blocking gamer accounts or other technical countermeasures were therefore considered ineffective and a waste of resources to implement, just as similar measures have been unable to prevent online piracy (e.g., torrent sites). Parents were identified as having a critically important role in regulating gaming activities for younger players. One participant stated, "*I feel this is the job of the parent and not anyone else*". Parents may be supported by education about: (1) games in general, (2) the ways in which games can be "addictive," and (3) how to recognize the signs of problematic gaming.

Freedom and free will matter greatly to the gaming community. Participants felt that it was important that gamers were free to make their own choices within and about games. Accordingly, opinions were divided on the role of industry in promoting healthy gaming. Their views ranged from "*The industry must bear this burden*" to "*Not really, they should just focus on making their product*". Similarly, there was mixed support for interventions. Some participants did not believe IGD was a legitimate condition, arguing that available resources should be used to treat more serious health conditions.

Industry and social responsibility

Several major software companies with international markets have provided user guidelines for safe Internet use. For example, Microsoft (2016) has developed an online "Healthy Gaming Guide" that states "repetitive movements, poor posture and overindulgence…can sometimes cause numbness, tingling and other issues that might escalate into serious health problems". Recommendations for safe use primarily concern the physical action of use (e.g., posture, viewing distance, method of pressing buttons), along with suggestions including taking breaks, managing stress, making healthy lifestyle choices, and consulting health professionals as required.

Microsoft, Sony, and Nintendo have provided online guides and video demonstrations on setting time limits and content restrictions on their gaming systems. Major online service companies, such as Apple and Google, have developed education for parents to explain privacy, filtering, and monitoring options, but these guides lack direct acknowledgement of gaming misuse and IGD.

There are some isolated cases of gaming developers including prompts in their games that instruct players to take breaks from the game (e.g., players are informed of how long they have been playing for and are then locked out of the game). The game *Clash of Clans* forces a brief break period for every 4 h and then a longer break after 12 h of play. Similar prompts can be found in some online games; for example, the game *Warframe* (i.e., "You have been playing for over an hour. Please don't forget to take a break"). An online game intended for children in China reminds players to take a break every 45 min and the game is shut down from midnight to 6 am daily (Lim, 2012).

Aside from the above examples, there is very little evidence of gaming developers taking a public stance on their social responsibility related to problematic gaming. As a rare example, Blizzard Entertainment issued an official statement to CNN in 2012:

> *"It is never our intent for our players to play our games to the exclusion of other activities… [but] it's ultimately up to the individual game player or his or her parent or guardian to determine how long he or she should spend playing any game"*
>
> *(Sutter, 2012).*

One may conclude from this statement that the intent of the game publisher is to shift responsibility for gaming misuse and IGD issues onto individuals and their families. It is notable, too, that the publisher refers to "*play…to the exclusion of other activities*", which is oblique language that does not directly acknowledge harm or negative outcomes.

Industry-academia collaboration

Can IGD researchers work with the industry? Some researchers hold to the belief that health and research bodies should not, under any circumstances, work collaboratively with industry bodies to study addictive behavior. This stance also extends to the development of harm identification and prevention measures. This follows an assumption

that the industry in question (e.g., alcohol, tobacco, or gambling) has no vested interest in the protection of its consumers because it sells a product that is inherently dangerous (toxic). The World Health Organization, for example, does not engage in any collaborative dialogue with tobacco companies on the understanding that tobacco products are counteractive to health.

Video gaming is not the same as a toxic substance. Gaming can often be a positive activity. In our view, the gaming industry should not be considered *by default* to be the same as tobacco companies. While the gaming industry is yet to demonstrate meaningful collaborative efforts with authorities on IGD prevention, this may possibly occur in the future.

Gaming and gambling are also distinct from substances in that it is arguably more difficult to study these activities in certain ways and contexts without an agreement or permission from the industry and/or its partners. For example, in relation to gambling, it would not be possible to examine the impact of safety measures (e.g., responsible gambling education) in gambling venues without the consent and cooperation of gambling operators or licensees and venue staff. Similarly, studies of gamers in gaming cafés, LAN tournaments, or gaming retail stores would not be possible without a similar agreement in place. Currently, there is no published evidence of research partnerships between academics and the gaming industry in relation to IGD intervention, suggesting there may be some reluctance or opposition on one or both sides.

Notwithstanding opposition to collaboration on principle, there are some promising areas for industry-academia partnerships, including:

(1) Sharing of user behavioral data;
(2) Access to users for surveys to then match with user account information;
(3) Trialing safety measures in games, such as pop-up notifications;
(4) Examining the psychological impact of in-game features; and
(5) Consulting academics in the design and testing of games under development.

Another possibility is industry funding of academic research under certain conditions (e.g., independence of research report authorship), given the difficulty in most regions for academics to attract competitive funding for IGD research when competing against teams studying health conditions of higher national priority (e.g., heart disease, cancer).

Summary: Real-time strategy

All individuals born into industrialized societies will be raised in environments where digital technologies are ever-present, easily accessible, and an integral part of everyday life. The implementation of measures to prevent as many of these individuals from engaging in levels of gaming use that cause harm or disruption to healthy functioning presents a major challenge. The task of preventing the onset and progression of IGD, like other addictive disorders, involves managing the influence of various risk factors, and increasing the influence of protective factors, on individuals susceptible to experiencing problems.

In practice, while parents are influential, IGD prevention is more complex than having parents turn off devices or limit screen time in children. It involves a coordinated effort by collaborating systems of care. Around the world, governments, policymakers, researchers, educators, and clinicians are beginning to recognize that the rapid expansion of treatment services for IGD should be complemented by a similar investment in early preventative measures. The research evidence on problem gaming prevention is still developing, but indicates that school-based education and skills training may be an effective approach.

The field is not yet at the stage of knowing clearly "*what works and for whom*" in IGD prevention. Some regions have provided useful work on the impact of national programs and technical measures to limit gaming activities, but cost-benefit analyses are lacking. Regional policies need to be empirically evaluated to identify best practice approaches. Researchers should work with stakeholders to apply their knowledge and assist in the development and testing of models of care and prevention.

The potential for industry-academia collaboration remains untapped despite the precedent for productive research partnerships in the gambling industry in some Western regions. The gaming industry on the whole has not introduced substantial user welfare measures, and they mostly appear to be silent on their social responsibility. Industry inaction may be due to poorly defined boundaries of responsibility and a perceived lack of commercial benefit or other incentives. The way forward in prevention ultimately rests upon all stakeholders working together in the public interest, confronting the reality of the IGD evidence base and developing practical, ethical, and sustainable countermeasures.

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Future directions for IGD

9

Chapter Outline

Introduction and overview

Internet gaming disorder is regarded as a condition that warrants further study (APA, 2013. An examination of its brief history, including research undertaken prior to the DSM-5, reveals that researchers have approached the topic of problematic gaming from many different perspectives, often without strong agreement on concepts and definitions (Dowling, 2014; Griffiths et al., 2016; Kaptsis, King, Delfabbro, & Gradisar, 2016; King, Haagsma, Delfabbro, Gradisar, & Griffiths, 2013; Petry et al., 2014; Sim, Gentile, Bricolo, Serpelloni, & Gulamoydeen, 2012). Not surprisingly, then, IGD research has yielded some inconsistent findings. This is particularly notable in examining prevalence studies of gaming disorder, with some reported estimates close to 1% (Bakken, Wenzel, Götestam, Johansson, & Oren, 2009; Rehbein, Kleimann, & Mössle, 2010) and others exceeding 10% (Grüsser, Thalemann, & Griffiths, 2007; Lin, Ko, & Wu, 2011; Wang et al., 2014).

The introduction of the ICD-11 and DSM-5 classifications should help researchers to achieve greater consistency in future studies, at least with respect to the conceptualization of gaming-related problems, if not methodology (Saunders et al., 2017). Such consistency can already be observed in recent treatment studies where it is becoming more common for researchers to employ the DSM-5 IGD criteria for admission screening and evaluating treatment outcomes (e.g., Martín-Fernández et al., 2017; Torres-Rodríguez, Griffiths, & Carbonell, 2017).

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A move toward greater consistency in the field, however, should not necessarily be implicated within recent criticisms of "confirmatory" approaches to the study of problem gaming and other addictive behaviors (see Billieux, Schimmenti, Khazaal, Maurage, & Heeren, 2015). The ICD-11 and DSM-5 criteria should aid in creating unity, but they do *not* prohibit researchers from exploring other models to understand problematic gaming. Nor should they discourage researchers from conducting studies that may challenge the validity of the diagnostic criteria (e.g., *tolerance*; Colder Carras et al., 2018; King, Delfabbro, Doh, et al., 2017; King, Delfabbro, Wu, et al., 2017; Snodgrass et al., 2017).

A unifying classification system enables teams of researchers to generate new research questions with more precision and to measure problem gaming constructs (e.g., *withdrawal*) in ways that enable easier comparisons of findings across other studies. A clear definition of gaming disorder also provides a focal point for further innovation and refinement in the field. The definition provides a common starting point that may help to assuage concerns about early IGD research that was often criticized for attempting to undertake too much too quickly, in the sense of drawing conclusions or pursuing certain lines of investigation without the necessary foundation of validated concepts or empirical data. For example, treatment studies have been criticized for lacking an empirically supported screening tool (Griffiths, King, & Demetrovics, 2014; King et al., 2013), just as screening tools have been criticized for lacking sufficient clinical evidence of gaming-related problems (Lortie & Guitton, 2013; van Rooij, Schoenmakers, & Van De Mheen, 2017).

Many of the criticisms of early IGD research may reflect, to some extent, certain practical constraints of the time rather than poor research practices. Historically, many IGD researchers (ourselves included) have been limited by: (1) *lack of access to certain populations* (e.g., treatment-seekers, vulnerable adolescents); (2) *lack of requisite skills, knowledge, or training* (e.g., clinical interviewing); (3) *lack of funding, infrastructure, or resources* (e.g., laboratory space); and/or (4) *lack of time* (e.g., time to administer follow-up measures) to undertake "gold standard" research. Research must start somewhere, using the best available information, even though it may be incomplete or be subject to limitations (Rehbein, Kliem, Baier, Mößle, & Petry, 2015).

Conducting studies in a strictly serial order that requires many years to complete, awaiting the results of project A before conducting project B, before finally undertaking research in high-priority areas (e.g., treatment) has its advantages, but it is usually not practical, especially for a new phenomenon. Researchers in the 1980s and 90s relied on lessons learnt from the study of problem gambling and substance dependence to quickly fill in gaps in the understanding of problematic gaming (Fisher, 1994; Griffiths, 1997; Soper & Miller, 1983). These considerations are important to remember in reflecting on the history and current context of IGD research. Over time, the field will become better positioned to examine IGD in new ways, from a range of different perspectives and using methodologies (e.g., big data, neuroimaging, twin studies, and longitudinal clinical studies) that were previously unavailable.

This chapter will begin by acknowledging the challenges in studying IGD due to gaming being a recreational activity enjoyed by many without resultant harms. We will then highlight some of the potential priority areas for future research on IGD.

These areas will include work related to IGD conceptualization, assessment, and intervention, as well as some specific projects that might yield useful insights on related questions. It will be argued that there is a need for greater international collaboration and data-sharing, and more conscious efforts to bolster the field's credibility and scientific standing through public representation of the field in ways that reflect the serious nature of problematic gaming.

Moral panic attacks

One argument that seems to have gained traction in the literature has been the assertion that IGD is essentially the product of a "moral panic" movement (Bean, Nielsen, van Rooij, & Ferguson, 2017; Ferguson, 2010; Kardefelt-Winther, 2014, 2015). Moral panic refers to the process by which emerging, but normal, products and activities are perceived to be dangerous or threatening. Thus, these activities become pathologized and considered necessary to regulate or control, based largely on judgments rooted in fear rather than evidence. The corollary is that IGD is not a real disorder, but an attempt to label an imagined or manufactured threat.

Fears about new media and technologies have existed for generations, particularly in relation to activities typically enjoyed by younger people, including comic books in the 1930s (Wertham, 1954) and television cartoons in the 1950s (Maccoby, 1951). Moral panic about gaming can be observed in reports by the mainstream media and anti-gaming lobby groups and in conversation with concerned parents. These parties will often attest that gaming is a "waste of time" or inherently harmful—even suggesting that gaming *in its own right* is a contributing factor to serious societal issues including family violence and other criminal activities, suicide, and premature death. For example, one of the most prominent psychologists of the 20th century, Philip Zimbardo, claimed that gaming (along with online pornography) was responsible for the "demise of guys" in a 2011 TED talk that has been viewed more than 2 million times (Zimbardo, 2011). In closing his talk, Zimbardo made the self-aware jest: "*So what's the solution? That's not my job. I'm here to alarm, it's your job to solve.*"

Those who argue that IGD is a by-product of moral panic have claimed that an official gaming disorder diagnosis will lead to two main negative outcomes: (1) *misdiagnosis:* an increased number of false positive cases (i.e., normal individuals being misclassified as "addicts") and (2) *stigma:* the stigmatization of all gaming (Aarseth et al., 2016). These two arguments are flawed and lack evidential support.

In rebuttal to the first proposition, it seems more logical to expect that an accepted definition of gaming disorder will *reduce* the possibility of false diagnosis, because standard criteria and guidelines lessen the need to rely on subjective judgments (Billieux et al., 2017). The ICD-11 classification states without ambiguity that gaming disorder is defined by functional impairment resulting from gaming, which precludes healthy individuals from meeting the diagnosis. Some critics may also be conflating *screening* with *assessment*—the diagnosis of IGD would not be solely determined by a few screening questions, but by a thorough interview and assessment. While the

prevalence of problematic gaming may vary across cultures and locales, the boundary between normal or safe gaming and pathological gaming (i.e., IGD) only becomes *clearer* with criteria and guidelines.

Counter to the second proposition, one could argue that it is a logical leap to claim that a gaming disorder classification will result in the stigmatization of all gaming on the basis that gaming is typically a normal activity. This criticism is questionable because it seems to be assuming that any disorder that refers—in its name or description—to any typical human activity (including thoughts, emotions, and behaviors) will stigmatize those who report these activities at healthy levels (Lee, Choo, & Lee, 2017). Classifying pathological behavior does not necessarily result in stigmatizing the normal equivalent. For example, following this argument, it would be concluded that *eating* is stigmatized by eating disorders, that *worry* is stigmatized by anxiety disorders, or that *religious belief* is stigmatized by delusional disorders. It should be noted, however, that this reasoning does not apply to those DSM-listed disorders that have recognized certain behaviors as *inherently* problematic—homosexuality as a disorder in the DSM-III is one such example. Homosexuality is a normal variation in behavior that was incorrectly pathologized by the DSM-III, consistent with the prevailing intolerant views of homosexuality as "immoral" or a "disease" (Mayes & Horwitz, 2005).

Returning to the topic of gaming, the ICD-11 and DSM-5 do *not* state that any and all types of gaming are harmful. IGD and healthy gaming coexist as independent constructs, even as individuals may move between these polar opposite categories—or others, including "hazardous" and "harmful" gaming. Recognizing that some gaming behaviors are harmful does not devalue the positive aspects of gaming for the wider population of normal gamers. Similarly, the fact that many individuals play games for positive reasons does not mean that gaming disorder cannot exist. As Saunders et al. (2017) argued, to oppose gaming disorder on these grounds would be "*equivalent to suggesting that because millions of people consume alcohol without problems that we should ignore the manifest harms (and mortality) that arise from its consumption for fear of stigmatizing those who are not harmed*" (p. 272).

Some critics of gaming disorder have claimed that the ICD-11 classification would not only stigmatize children who play games, but would also generate *new* tensions in parent-child relationships that might lead to caregivers committing acts of "violence against children" (Aarseth et al., 2016, p. 269). This argument employs provocative language that is arguably intended to be fear-provoking and is probably more so than the subject matter it criticizes. More pertinently, this statement has not been accompanied by any supporting evidence, such as research showing a link between a child's mental health diagnosis and parental violence toward that child. We are more convinced by the notion, in line with clinical observations, that some parents are subjected to acts of verbal and physical aggression by problematic gamers (usually teenage males) when, for example, these gamers lose their gaming or internet access privileges, or their gaming sessions are interrupted and/or result in failure. The link between aggression and gaming disorder in adolescents (NB: *not* violent video games and aggression, which is a separate literature with different proposed mechanisms) has been reported in studies *prior to the IGD classification*, indicating that the DSM-5 was

also irrelevant to this relationship (e.g., Festl, Scharkow, & Quandt, 2013; Lemmens, Valkenburg, & Peter, 2011; Young, 2009).

Along similar lines, critics including Aarseth et al. (2016) have argued that the IGD classification would potentially expose more children to the risks of forced "boot camps" (see Koo, Wati, Lee, & Oh, 2011). This also seems quite speculative because these camps have existed and expanded across various regions in East Asia prior to the preliminary discussions or formal recognition of gaming disorder. Referrals to these camps are made by caregivers who often appear motivated by despair and desperation due to the lack of other options, rather than stemming from their knowledge of mental disorders and/or developments in relation to the DSM-5 or ICD-11. In our view, an official diagnosis of gaming disorder would have the more likely result of granting families better access to alternative treatment options, including insurance coverage for gaming-related problems in some regions. The IGD/GD diagnosis should also increase the availability of free (i.e., state-funded) options, such as research clinics, as it has been observed in the case of other disorders that require special treatment approaches.

Opponents of IGD/GD have also argued that the diagnosis would make it more difficult for individuals with gaming-related problems to change their behavior and engage in therapy (van Rooij & Prause, 2014). It is claimed that clinicians informing their clients that their addiction is defined by "loss of control" would result in the client internalizing a sense of powerlessness and becoming less capable or motivated to make positive changes. We agree that some clients will tend to perceive their problems as intractable and permanently debilitating, particularly those with chronic health issues. This is not unique to addiction, but applies to mental health issues including posttraumatic stress disorder and depression, among many other disorders. However, taking the alternative action—to *not* inform the client of the diagnosis and how it relates to their care—seems negligent and unethical and likely to cause significantly more challenges and problems for the client (as well as for the therapist) than granting any benefits, notwithstanding the awkwardness and practical obstacles in discussing and documenting the client's main problem using alternative language. It is *almost always* better for all parties involved to be able to speak with clarity and shared understanding.

While moral panics about popular culture do exist and have for a very long time (Lopes, 2006), such pressures and panic have *not* been the driving force behind the gaming disorder classifications. The workgroups responsible for these classifications have been open and transparent about the timeline of work and methodology used to create them (APA, 2013; World Health Organization, 2015). These classifications have been carefully considered and reviewed over many years in consultation with dozens of experts who have studied the available evidence, including population data and clinical case studies from around the world. If IGD were the product of moral panic and was not evidence-based, one might expect similar diagnostic categories of "*Facebook addiction*" or "*smartphone addiction*" (among others) with weaker supporting evidence to have also emerged in the DSM-5 and ICD-11 in this time. This has not happened, despite similar concerns in the wider community about these platforms and technologies.

In summary, the proposed IGD and GD categories reflect a growing clinical reality of genuine gaming-related problems with an associated need for effective health responses. While it is unfortunate that some opportunistic individuals might attempt to use these new classifications to serve personal agendas, this does not outweigh the greater benefits of clinical classification for individuals and families with IGD.

Believe IGD or not

Like all fields of science, the study of IGD has been propelled forward by many earnest and usually well-intended individuals who reflect regularly on issues of relevance to the field. The field and its core topics, and the nature of video gaming itself, have changed a lot over time. Accordingly, professional views should be expected to change and be updated over time, with the accumulation of new evidence and reexamination of the old. It is healthy (and necessary) for scientists to acknowledge past errors and change their views.

We have expressed viewpoints in our own talks and published work that, on reflection, we would now retract or modify to some degree. It is reasonable, too, for some researchers to feel that certain evidence is too preliminary to reach any firm conclusions on a specific issue. Przybylski, Weinstein, and Murayama's (2017) cautionary note, for example, that the limited available resources for research and treatment of psychiatric disorders should be prioritized to areas relative to their clinical evidence of harm is apt in this context. The study of IGD is a new field, so the act of refraining from strong conclusions may sometimes be the most appropriate response.

It may be puzzling to some observers, then, that there are scholars who appear to have taken both a supporting *and* opposing stance on whether IGD is a legitimate problem. An *ambiguous* stance may be another characterization in some cases. For example, some researchers have published work (e.g., commentaries) that argues against the introduction of the IGD/GD classifications *and* they have published quality research studies that support the status of these classifications, or at least the phenomenon of problem gaming from an addiction perspective. This leaves an impression that these authors are firmly *against* the inclusion of gaming disorder in the ICD-11 (e.g., Aarseth et al., 2016; Bean et al., 2017; van Rooij & Prause, 2014), and that these same authors have provided empirical support *for* the existence of IGD or the validation of IGD symptoms.

Research support from IGD/GD opponents appears to be evident in valuable work on: *the identification of addicted gamers* (Przybylski, Weinstein, & Murayama, 2016; van Rooij, Schoenmakers, Vermulst, Van Den Eijnden, & Van De Mheen, 2011), *risk factors* (Hussain, Griffiths, & Baguley, 2012), *meta-analysis of prevalence rates of the disorder* (Ferguson, Coulson, & Barnett, 2011), and *clinical validation of a gaming addiction screening tool* (van Rooij et al., 2017). Of the above cited authors who have recently declared that gaming disorder *should not* be included in the ICD-11 (see Aarseth et al., 2016), Ferguson and Przybylski appear to cautiously support "problematic gaming" as a topic of clinical importance but they draw the line at recognizing "gaming disorder." Their papers' conclusions state that IGD (if it exists) appears to be

much less common and severe than pathological gambling, and that IGD should be validated further before it is committed fully to the DSM/ICD.

We would respond to these arguments that the prevalence of a disorder (including its prevalence relative to another disorder) should not have strong bearing on its legitimacy (unless it is truly minuscule, which IGD is not) because many disorders are quite rare and may be difficult to detect using conventional research methods (e.g., surveys). We would add that it is generally helpful for researchers to specify in advance the threshold of evidence required to support a new disorder. In contrast to these authors' apparent personal views and conclusions (i.e., opposing GD/IGD on "moral panic" grounds), we feel that much of their work, which includes large-scale research studies, has been very valuable to guiding the identification of IGD, particularly in refining current measurement approaches.

In contrast to Ferguson and Przybylski, some other opponents of gaming disorder appear to be more directly supportive of gaming disorder in their other work, including work that would appear to serve the mutual interests of the authors and those working in the field. For example, in a recent paper that presented a new IGD tool for clinicians, van Rooij et al. (2017)—i.e., the lead researcher has opposed GD in the ICD-11 (see Aarseth et al., 2016)—concluded that "*in the future, the DSM-5 criteria will undoubtedly be validated and tested more widely*" (p. 273). Granted, this quote may not be an explicit statement of *personal* support for gaming disorder, but one should consider that the researchers are proposing a new clinical interview tool for IGD. It seems fair to conclude that they intend their tool to be used by clinicians for diagnostic purposes, i.e., a move which seems contradictory to opposing GD in the ICD-11. Why create a clinical interview protocol for a disorder that one is opposed to?

Some other "opposing" authors have published other work that supports gaming disorder in an indirect way. For example, some researchers will use the term "*problematic gaming*" as an alternative to "pathological gaming" or "gaming disorder." This term will be accompanied by the explanation that the terms "addiction" and "disorder" are "controversial" (but not always with further elaboration on what specifically is controversial). The work will then effectively be no different in other important respects to the studies that use the term "gaming addiction." The work will employ a gaming disorder scale, such as the *Game Addiction Scale* (Lemmens, Valkenburg, & Peter, 2009), and the presented findings will highlight that some individuals are more "at-risk" or that certain types of games are "problematic" (again, avoiding the term "addictive"). This work will not present alternative hypotheses or explanations for problematic gaming. The authors will explain that the study purpose was *not* to resolve issues relating to addiction. A recent study by Haagsma, Pieterse, and Peters (2012)—i.e., another lead researcher who opposes GD in the ICD-11 (see Aarseth et al., 2016)—meets all of the above criteria. In our view, these types of studies are essentially IGD studies in all ways but name.

IGD/GD have recently received a number of published critiques from *many within the field*. For example, many of the 26 authors listed on the most recent commentary paper in *Journal of Behavioral Addictions* that opposed the inclusion of "Gaming disorder" in ICD-11 (Aarseth et al., 2016) are active or formerly active researchers in IGD and problem gaming. Their research has demonstrated that there are serious

negative consequences of excessive gaming, as routinely measured by scales based on the addiction model. This strikes us as a curiosity, if not a contradiction. One might ask: If these authors are opposed to gaming disorder *in principle*, to what end was their own research being conducted? Their studies did not propose or test alternative explanations to "disprove" gaming disorder. What did they consider to be the main practical benefits, aside from the ambiguous goal of providing "relevant data"?

Gaming bias among professionals

Skepticism is a vital attribute of researchers in all fields of study, particularly in a new field, to ensure that certain assumptions do not carry researchers too far ahead of themselves. Self-awareness of one's own attitudes and biases may determine whether one applies self-correction or seeks critical feedback from colleagues. It is possible, perhaps, that natural skepticism (or lack thereof) may underlie some researchers' views on the validity of IGD, as well as personal views of the harms related to gaming.

Studies by Ferguson and colleagues have examined whether personal beliefs about gaming may affect the extent to which professionals perceive gaming as a harmful activity. Ferguson (2015) surveyed 109 clinicians and clinical researchers about their views concerning positive and negative effects of gaming on children. He reported that older and female participants were more likely than others to report that they believed that games were harmful. However, there was no consensus among the participants on whether gaming was harmful, suggesting that professionals' stance on this issue might be influenced by factors other than evidence.

In another study, Ferguson and Colwell (2017) surveyed 175 psychologists, criminologists, and media scholars. In line with the 2015 study, it was found that older age and inexperience with games predicted more negative views toward gaming. While these two studies employed nonrandom samples, and did not demonstrate causal relations, the results still highlighted that personal views on gaming appear to vary along demographic lines within the health professional community.

While Ferguson's work presents interesting findings that are worth documenting, these results on their own are not necessarily evidence of systematic biases in research or clinical practices related to IGD specifically. A more negative attitude toward gaming does not necessarily override clinicians and researchers' desire and capacity for objectivity, or their relevant training and code of conduct.

If Ferguson were to discover that personal bias had consistently compromised IGD "diagnostic" practices, that would indeed be a noteworthy and worrisome finding. His work is still thought-provoking and should be considered further in relation to IGD research topics. It may be interesting, for example, to consider why some IGD researchers support the inclusion of IGD while others do not, including whether this important stance that shapes our field might be related to factors that are unrelated to research evidence, such as protectiveness toward gaming due to factors such as fondness of games, undisclosed commercial interests, or some other personal attachment to gaming products or individuals involved in games. These biases may be potential barriers to unity and consensus in the field.

It bears noting, too, that some researchers' true position on IGD may not be easy to parse from their published papers. Researchers may publish certain views for and against IGD in their purest or "concentrated" form (i.e., without referring to certain caveats, doubts, or complexities), in the interest of parsimony or due to other constraints on writing. Anonymous reviewers may also request that researchers include opposing stances (and citations to related work). Similarly, some authors may write in an intentionally neutral or noncommittal way, or "cover all bases," to avoid committing to one side of the debate and its associated politics.

Another possibility is that certain arguments related to IGD as a construct may become simplified (e.g., due to constraints on writing) such that they appear to support or oppose IGD unreservedly. Thus, some arguments may not necessarily align exactly with researchers' personal views, even when viewpoints are presented from a first-person perspective. Finally, a singular published work with multiple authors should not be assumed to represent exactly the views of all authors, which is relevant to much of the above discussion.

Future research priorities and objectives

Many further studies are needed to develop the IGD field. This section will outline specific areas and the types of studies that may have some conceptual and practical value. Some of this work will already be apparent from content in previous chapters. While these studies have been separated into the following sections, it should be noted that these areas are not strictly delineated boundaries and that developments in one area may contribute to others.

Describing and refining concepts

Many researchers have challenged the suitability of applying concepts within the classic addiction model to gaming behavior (Charlton & Danforth, 2007; Kardefelt-Winther, 2015; Starcevic, 2016). Further work that describes how certain concepts, such as withdrawal and tolerance, may apply specifically to gaming may aid this debate.

Some emerging work on "craving" in gaming, for example, seems to indicate that this process may operate differently in relation to gaming as compared to other addictive behaviors (Dong, Wang, Du, & Potenza, 2017; King, Kaptsis, Delfabbro, & Gradisar, 2016). However, as Heinz, Selbmann, and Romanczuk-Seiferth (2017) have noted, some of the symptoms of IGD have an "inherently subjective character" (p. 382) and are likely to lack neurobiological markers. Nevertheless, further refinement of concepts might be achieved through studies employing in-depth interviews with individuals with clearly identified gaming problems, e.g., individuals in treatment settings, rather than healthy convenience samples. Interviews enable greater flexibility than survey items to clarify and verbally probe for more details from participants on their problematic gaming experiences.

Mixed observations within survey research more generally suggest a need for more qualitative research and clinical case studies in this area. Qualitative studies should

include commonly used screening and assessment items not only as an interviewing prompt, but also to determine the level of consistency between items and individuals' experiences. Research agendas on the study of gaming-related problems and gaming disorder should be aided by complementary efforts to clearly define "safe" gaming (Desai, Krishnan-Sarin, Cavallo, & Potenza, 2010).

Having a clear description of healthy and adaptive gaming, including indicators other than playing in "moderation" (e.g., playing for less than 2 h per day, as per some guidelines), would help refine public health agendas. Defining safe gaming may also help to refine the clinical guidelines for IGD to avoid misdiagnosis in borderline cases. Further work is also needed to understand the relations between the nine IGD symptom criteria and whether the currently proposed cut-off is optimal, given work that suggests that a cut-off of six or more may be more optimal (Lemmens, Valkenburg, & Gentile, 2015).

Improving instrumentation

Chapter 5 concluded that there was no shortage of tools that measure problematic gaming and IGD. An overabundance of tools with different constituent properties has arguably been detrimental to the field in its pursuit of consistency and consensus (King et al., 2013; Petry et al., 2014). For this reason, the recent inclusion of "Gaming disorder" (GD) in the ICD-11 may reinvigorate the desire of some researchers to "rush to market" by developing additional screening and assessment tools specifically aligned with the ICD-11 system. We note, however, that the GD classification differs from IGD in that GD is more parsimonious in terms of core criteria (i.e., 3 vs 9 criteria). This difference may be identified by some researchers as a reason to justify the development of a new tool to address a "gap," but we believe that developments of this nature may be damaging to the field if it led to dozens of new "GD" tools being developed. This would effectively be a "repeat performance" of the similarly named tools with differently worded items (e.g., Lemmens et al., 2015; Pontes, Kiraly, Demetrovics, & Griffiths, 2014) that emerged following the inclusion of IGD in the DSM-5.

The field would benefit from a high-quality, cross-culturally validated measure that captures the essential features of IGD and GD. This measure should be developed as a cross-culturally representative and collaborative effort, involving teams representing regions where gaming-related problems have tended to have been identified (e.g., South Korea, China, Japan, the United States, the United Kingdom, Germany, and Australia). An internationally recognized "gold standard" screening tool would promote greater research cohesion and efficient comparisons of findings. This tool could then be complemented by a brief interview protocol that gathers other relevant gaming-related contextual information for case formulation.

Big data and player tracking

Many studies of problem gaming and IGD have employed online convenience samples, such as university students and online gamers. Self-report data is often criticized for its lack of validity and representativeness. One of the main problems is that people

may be generally quite poor at estimating their gaming behavior and describing their past experiences with gaming. Given that gaming technologies and products already keep track of many player actions, there are many potential opportunities to combine player tracking with psychological survey variables. Some researchers have already conducted studies that successfully utilize historical online data from players in combination with survey data (e.g., Billieux et al., 2013).

Gaming leaves digital records and traces. Future research could build upon past efforts by employing "big data" and behavioral tracking data in special IGD populations, including those seeking treatment for IGD. It may be possible, for example, to examine the playing histories of individuals who present for treatment, which may lead to identifying patterns of behavior that may indicate a "turning point" from normal to problematic use. Such work may help to develop an online early detection system for IGD that could be implemented in certain types of games where risky gaming is known to be more common (e.g., MMO games).

Epidemiological and survey studies

The study of IGD has relied greatly on the goodwill of online gaming communities to support its survey-based research studies, with many of these individuals completing surveys often with minimal or no compensation (Griffiths, 2010; King, Delfabbro, & Griffiths, 2009; Wood, Griffiths, Chappell, & Davies, 2004; Wood, Griffiths, & Eatough, 2004). While this convenience sampling approach may continue steadily for the foreseeable future, researchers should aim to complement this work with more studies that employ generally representative samples.

Representative sampling is particularly important for studies seeking to identify patterns, causes, and effects of problem gaming over time. Many scholars have noted that, with some exceptions (e.g., Brunborg, Mentzoni, & Frøyland, 2014; Gentile et al., 2011; van Rooij et al., 2011), the field has lacked high-quality longitudinal studies of the prevalence and incidence of IGD. Similarly, few studies have been adequately equipped to track the general progression of gaming activities across developmental stages and life stages (e.g., school completion, marriage, stressful life events). Therefore, it is currently unclear which demographic factors, gaming activities and behaviors, and psychological variables, may predict the greater likelihood of *intermittent* versus *continuous* courses of IGD. Understanding the natural history of gaming disorder and common time frames in which gaming problems can occur for different profiles of users would be helpful to the basic understanding of the disorder, including its clinical descriptions. This information would also factor into risk management and care plans (Petry & O'Brien, 2013).

In addition, while comorbidity issues (e.g., depressive symptoms) are commonly addressed in screening surveys, few studies have attempted to assess the broader picture of gaming-related harms that occur in the context of IGD. Such work has produced informative insights in the field of gambling disorder (see Langham et al., 2015; Li, Browne, Rawat, Langham, & Rockloff, 2017; Salonen, Alho, & Castrén, 2016). A particularly understudied area of IGD is the *negative health effects* of excessive gaming, including physical injury, pain complaints,

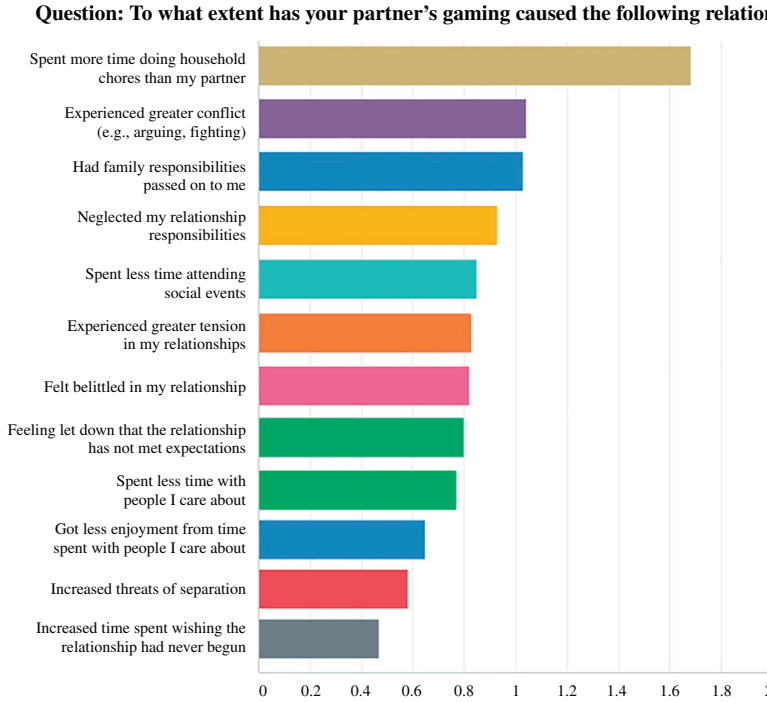

Fig. 9.1 Relationship conflict issues reported by partners of problematic gamers.

cardiovascular fitness, doctor visits, and days missed due to illness. Such harms could be examined using quality of life measures to provide a more complete profile of individuals with IGD.

In 2017, we conducted a preliminary (currently unpublished) study that surveyed 274 partners of individuals who regularly played games, including those who played games problematically, to examine some of the potential gaming-related harms. Harms included relationship conflict, financial burdens, work-related impacts, and mental health effects. Fig. 9.1 presents a summary of the IGD-related relationship complaints and difficulties (as a weighted average, where 0 = Never, 1 = Sometimes, 2 = Most of the time).

This preliminary study highlighted that there were *emotional impacts* (e.g., loss of intimacy, regret) and *practical duties passed on to partners* (e.g., additional housework, child-rearing) due to problem gaming. Further studies should examine such negative consequences in more detail, including the ways in which individuals with IGD may affect the lives of *multiple* others (e.g., partners, friends, and work colleagues). Studies of the mechanisms that underlie gaming-related harms are needed (e.g., mood changes, social disconnection, or neglect due to displacement). This research may quantify, at a population level, some of the public health burden associated with problematic gaming, relative to other diseases and conditions.

Effective interventions

Chapters 7 and 8 examined some of the current approaches to treatment and prevention of gaming-related problems. To briefly reiterate some of this discussion, a key focus for future treatment research should be to conduct more randomized controlled trials, particularly for cognitive-behavioral therapy and drugs (e.g., mood stabilizers).

Studies should include a follow-up assessment, even if this takes the form of a mail survey rather than face-to-face evaluation, and report results even if the response rate is low. Family-based therapies for adolescents require more empirical attention given their promising findings (e.g., Liu et al., 2015). Improving outpatient approaches may help in offering an alternative to more expensive "retreat" options for families (e.g., the reSTART program). Additional work on cognitive-behavioral therapies is needed to articulate the cognitive component of these therapies in more detail (Delfabbro & King, 2015). Similarly, the field would benefit from having more treatment manuals and resources for training and research purposes.

Another important gap in the literature is data concerning the effectiveness of different approaches and "best practice" for individuals with IGD and comorbid disorders. A good example of this is in relation to prevention and harm reduction, where it would be helpful for policymakers to receive data-driven evidence on which policies (e.g., shutdown policies) and public programs may be most effective in reducing harms (see Lee, Kim, & Hong, 2017). Finally, research should determine whether there are unmet demands and service gaps across regions, including demands for adolescent and parent education, i.e., what are the needs of individuals and families with IGD and how can these needs be most efficiently met?

Neuropsychological research

The study of IGD from a neuropsychological perspective is a rapidly growing area (Brand, Young, & Laier, 2014; Kuss & Griffiths, 2012; Weinstein, Livny, & Weizman, 2017). Studies of the impact of gaming disorder on neurocircuitry and cognitive functioning can provide more objective insights into the functional differences between healthy and pathological gamers. One of the limitations of current studies has been the extreme heterogeneity of participants given the wide range of Internet and gaming activities. Not all games and gamers are the same, but they are often assumed to be. This could be addressed by ensuring that studies select only participants who play the same type of game (see, e.g., Deleuze, Christiaens, Nuyens, & Billieux, 2017), but this approach has the trade-off of reducing generalizability of findings.

Han, Kim, and Renshaw (2015) suggest that neuroimaging studies should always aim to include *professional* gamers as a comparison group (in addition to a nongaming sample) when examining individuals with IGD to improve the detection of underlying vulnerability and brain changes. Han et al. also state that neuroimaging studies would benefit from imaging genetics to deduce how genetic variants impact certain brain areas, both structurally and functionally, i.e., to identify potential interactions between neurotrophic factors, receptor genes, and grey matter volume.

Ko, Liu, and Yen (2015) further advise that future studies using neuroimaging should include several methodological improvements, including (but not limited to): (1) the use of *larger and more diverse samples*, including females; (2) the *inclusion of psychiatric interviews* to identify appropriate more cases; (3) a *multidisciplinary group* to improve the design and implementation of studies; and (4) employ *more advanced techniques* (e.g., arterial spin-labeled perfusion). Neuropsychological measures would be an invaluable addition to clinical trials, to enable assessment of functional brain changes and cognitive improvements (e.g., optimization of inhibitory control or decision-making skills) in response to treatment or following long-term abstinence or reduced gaming.

Game design and monetization

Future research should consider the changing nature of game design, gaming systems, and their interface with other classes of activity. Over time, gaming activities have become increasingly more complex, immersive, socially connected, and monetized products. Although many comparisons have been made between gaming and gambling (Forrest, King, & Delfabbro, 2016; Griffiths, 1991; Johansson & Götestam, 2004), most modern gaming activities are much more technologically complex than online gambling and electronic gambling machines. The range and diversity of features in video games present some challenges in designing experimental studies that can adequately isolate and examine their impact on gaming behavior (e.g., *game difficulty;* Smith, King, Richardson, Roane, & Gradisar, 2017). For these reasons, there is a general need for more research on the "player-product" interaction (Murch & Clark, 2016), that is, studies that recognize that certain products affect certain players in particular ways. This might include research projects that examine differences in the types and rates of occurrence of IGD symptoms according to different types of games, or an analysis of different players' beliefs about structural characteristics of games (King, Delfabbro, & Griffiths, 2010; Westwood & Griffiths, 2010; Wood, Griffiths, Chappell, & Davies, 2004; Wood, Griffiths, & Eatough, 2004), including random events and reward payout.

Another area of interest is the crossover and shifting boundaries between gaming and gambling, sometimes referred to as "convergence" (Gainsbury, Hing, Delfabbro, Dewar, & King, 2015; King, Delfabbro, & Griffiths, 2010). Recent technological developments have enabled players to engage in various betting activities within and in connection with online games. Some of these activities may be purely "simulated" (i.e., not involving winning real money), whereas others may involve betting systems that enable players to use virtual goods that can be exchanged for real money via a secondary market (e.g., "*skins betting*") (Holden & Ehrlich, 2017). Independently of innovations in gambling, many high-profile retail games with large teenage audiences are becoming more monetized. For example, games have adopted revenue models that rely on "microtransactions" and other paid digital content options that encourage players to make nonrefundable purchases in games to acquire cosmetic rewards and/or competitive advantages.

These developments highlight the rapidly evolving nature of gaming products and the associated regulatory challenges. A greater understanding of this area may be

achieved by conducting more in-depth analysis of the games and the business practices of top gaming companies. We have recently conducted a preliminary review of design patents for monetization schemes in games, which has highlighted that top game companies (e.g., *Electronic Arts, Activision Blizzard*) have invested in game systems that:

(1) make games harder without spending money;
(2) adapt to the spending patterns of players to incentivize more spending;
(3) require spending for game progression and access; and
(4) advertise financial elements using data from other players and other online services.

Fig. 9.2 presents a 2015 patent by Marr, Kaplan, and Lewis (2017), for example, that refers to a system that "*may match a more expert/marquee player with a junior player to encourage the junior player to make game-related purchases of items possessed/used by the marquee player*". The intent of the system is to encourage the junior player to emulate the marquee player by spending money to obtain the same weapons or other items used by the marquee player.

Game monetization systems and related technical developments suggest that the financial aspect of gaming might contribute to significant harms for some users. For example, some cases of excessive spending on virtual items (i.e., spending that exceeds annual income) are beginning to be documented in treatment clinics and in the media. Relatedly, there is an underexamined issue of youth exposure to gambling activities and promotions via eSports activities, within the broader context of gambling products being advertised through online social platforms (Abarbanel, Gainsbury, King, Hing, & Delfabbro, 2017; King & Delfabbro, 2016).

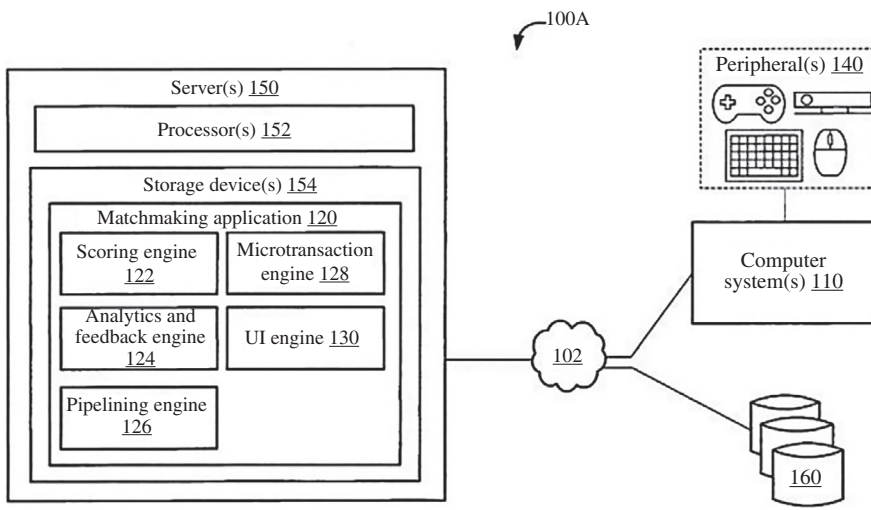

Fig. 9.2 A patent for a microtransaction matchmaking system in an online game (Marr et al., 2017).

Other ways to expand the field

Aside from conducting further studies, there are numerous other ways in which the study of IGD can grow. While the IGD literature is often described as "young," "emerging," and "nascent," there is actually a relatively large number of publications on IGD. The precise number of academic publications of all types on "IGD" and "problem gaming" has not been calculated recently, but we would estimate that it exceeds *at least* 2000 articles.

The study of IGD may benefit from work that adapts or translates this knowledge base (including its expert opinion, when it is grounded in evidence) into more *practical* outputs, including resources for public health and clinical settings. It has been noted that there are few available specialty books and treatment manuals (King, Delfabbro, Wu, et al., 2017), but there is also a dearth of accessible information in many other areas. For example, there is a lack of educational resources suited to high school-aged male adolescents, despite this group representing the most vulnerable demographic for IGD. Parents and teachers would benefit from an evidence-based practical handbook to manage problem gaming issues in different groups and contexts.

Another issue that is rarely acknowledged is the massive gulf between the English and non-English IGD literature. Many important studies and explanations of recent developments (e.g., national policy innovations) are published in Korean and Chinese journals and gray literature. Practical efforts to translate this important work into more languages (e.g., plain language summaries on an independent IGD research exchange website) would help to promote greater understanding of the field and facilitate networking and collaboration of researchers in complementary areas. Relatedly, some researchers have taken positive steps by promoting an open science approach to developing consensus on behavioral addictions (see Kardefelt-Winther et al., 2017) and encouraging data-sharing and transparency of research procedures (e.g., Przybylski et al., 2016).

The field of behavioral addictions has grown rapidly in the last decade. This growth has been assisted by the availability of outlets for researchers to publish their work, such as peer-reviewed journals that cater specifically to technology-related addictive behaviors (e.g., *Journal of Behavioral Addictions*, *Computers in Human Behavior*, *CyberPsychology*, *Behavior, & Social Networking*). Similarly, some journals that had previously only considered submissions on substance-related disorders have expanded their scope to include gambling, gaming, and Internet-related behaviors (e.g., *Addictive Behaviors*, *Psychology of Addictive Behaviors*). A challenge for the field is to publish work in nonspecialty journals, including high-impact general psychology and psychiatry outlets to bring greater attention to the area.

There are now more forums and conferences that cater to gaming disorder-related issues than compared to a decade ago (when there were almost none). This is an encouraging sign of progress, and it is hoped that these IGD-inclusive conferences will continue their expansion into more countries. The representation of IGD topics in general psychology, public health, and psychiatry conferences, along with specialty conferences across different regions, would be a significant boon to the field in its aim of sharing and promoting new ideas. There is perhaps no better introduction for early

career researchers to a field than to have the opportunity to meet their colleagues in person. Thus, the availability of financial support for student projects on novel IGD topics, as well as travel grants to these conferences, would be a major help in attracting and retaining newcomers to the field.

As the field grows, there will be continuing debate on whether, and to what extent, researchers should engage collaboratively with the gaming industry (van Rooij, Meerkerk, Schoenmakers, Griffiths, & Van De Mheen, 2010). There may be a need for guidelines in this area to ensure that joint efforts are ethical and mutually beneficial. This may extend to issues of responsibility in relation to academics who are invited by the gaming industry to give public presentations on IGD and related topics. It is our view that there are some research projects that require cooperation with the gaming industry, and therefore, it would be unwise for the field to adopt a "zero dialogue" approach with all commercial gaming entities. Access to player data (e.g., big data) and entry to gaming venues, for example, are unlikely to occur without these interactions.

Researchers should proceed with caution to avoid personal exploitation or the misappropriation of intellectual content to serve commercial interests. Some research questions and arrangements may be "off-limits" because they do not lend themselves well to objective research. Any relevant interaction and partnership with industry should always be disclosed by authors as a potential conflict of interest. It bears noting, too, that the need for industry funding diminishes in a research environment where other funding opportunities are available. The lack of funding options has arguably been a contributing factor to the lack of compliance with international standards for health and clinical research (King, Delfabbro, Doh, et al., 2017).

Summary: The endgame

It is encouraging that the IGD field has grown so rapidly and attracts significant global attention. The growing interest from within addiction psychiatry, clinical psychology, and public health (among many other disciplines) has followed the increased public and governmental awareness of the negative health consequences of gaming behaviors in many jurisdictions (King, Delfabbro, Doh, et al., 2017). While researchers continue to debate the nature of IGD among other related issues (Griffiths et al., 2016; Kardefelt-Winther, 2015; Petry et al., 2016), there appears to be general agreement that IGD and problem gaming require further study to develop more appropriate health responses (Saunders et al., 2017).

At the same time, we have observed that some of the discourse on IGD and problematic gaming, including opinion and commentary within and outside of academia, may be driven by a desire to generate publicity or controversy to boost reputations and agendas, rather than serve scientific interests or help those affected by IGD. Oversimplified representations of problem gaming and its research base may hinder this young field in its search for credibility and acceptance. Sensationalism is probably common in many fields, but may be exacerbated in the case of IGD by factors such as parents' natural concerns about children overusing digital technologies (Lee, 2013)

and the popular appeal and topicality of gaming addiction stories in the mainstream media 24/7 news cycle (e.g., see BBC News, 2005; CNN, 2012; Deccan Chronicle, 2015; Mirror, 2015).

Thoughtful, open, and responsible discussion is needed to lead the next phase of IGD research. Researchers should collaborate to identify and address gaps in our understanding of IGD (Griffiths et al., 2014; Petry & O'Brien, 2013). The field will not benefit much from reflections on its flaws, limits, and problems without practical and feasible proposed solutions. Similarly, only so much can be learnt from repeatedly conducting the same types of studies (e.g., online studies that administer self-report addiction checklists to self-selected adult gamers). The study of IGD is not just being held back by unknowns, but also by those with a vested interest in *not knowing*.

One of the greatest obstacles to progress in this field, at the time of writing, concerns its status as a disorder in need of "further study." All disorders require further study, but the study of IGD is often perceived as an area where the required high-quality work has *barely begun*—because so much good work is overshadowed by poor work. The field has vocal opponents who highlight the weak links in the chain of evidence and conclude that there are fundamental flaws in its assumptions and approaches.

Similarly, some scholars support the DSM-5 and ICD-11 gaming disorder classifications in principle, but propagate a view of problematic gaming as an overly contentious or empirically unstable topic of scientific inquiry, possibly to generate "buzz" (e.g., social media attention), but they do so at the risk of compromising the perceived scientific integrity of the field as a whole. Sensationalism has already undermined, for example, the study of potential aggression effects of playing video games featuring depictions of violence (see Markey, Males, French, & Markey, 2015).

Many of the scholars opposed to IGD are not clinicians; they have not faced individuals or families affected by IGD. Some may wish, perhaps, to preserve a certain idyllic view of gaming as a fun, harmless hobby. Opposing IGD based on misplaced overprotectiveness and naivety of clinical realities may have real negative impacts on the field, such as reducing the willingness of peer-reviewed scientific journals to receive and accept submissions on IGD and limiting the availability of competitive funding opportunities for IGD studies. After all, why should funding bodies award grants for IGD research if its community of researchers appears so divided and unconcerned with sensible discussion of the empirical evidence? New research, however convincing, may be disregarded in this environment.

In this light, one might consider, for example, whether published views of IGD research as "*chaos and confusion*" (Kuss, Griffiths, & Pontes, 2017), "*inappropriate and misleading*" (Wood, 2008), and "*irresponsible to support*" (van Rooij & Kardefelt-Winther, 2017) do more harm than good (Note: all of these authors have also published good research that appears to favor a view of gaming as "addictive"; e.g., Kuss, Louws, & Wiers, 2012; van Rooij et al., 2011; Wood & Griffiths, 2007). Do these terms contribute to the public understanding of IGD and orientate stakeholders to gaming-related harms as an issue of research priority? The integrity of this emerging field may be more greatly threatened *from within its ranks* by scholars' poor choice of words, than by criticisms from anti-IGD entities outside the field, including a powerful industry working to protect its commercial interests.

The path for IGD to attain diagnostic legitimacy and public acceptance will require the development of a sound evidence base on which to base its new ideas, tools, and interventions. This will take some time and require many collective efforts. Exciting prospects and discoveries lie ahead, and the study of IGD-related topics has potential to advance knowledge in related areas of psychopathology (e.g., gambling disorder).

It seems unreasonable to expect that a total consensus on IGD will ever be achieved, and arguably it is better than one never is (Quandt, 2017). Digital gaming technologies will continue to evolve—becoming more social, immersive, and monetized—consequently, gaming behaviors and resultant problems will change shape too. This book has provided a glimpse of the current state-of-the-art. It is hoped that much of this work becomes outdated soon.

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