

“From Angry Birds to Grand Theft Auto”

Psychological Principles Underlying Video Gaming Use by Children and Adolescents

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On May 12, 2012 Angry Birds, the video game franchise created by Rovio Entertainment of Finland, achieved one billion downloads. This feat seems all the more remarkable considering that its first release occurred just 29 months earlier in December, 2009. The game is available as a free or paid (no advertising) game and currently has at least six versions (Angry Birds, Angry Birds Seasons, Angry Birds Rio, Angry Birds Space, Bad Piggies, and Angry Birds Star Wars).

The primary platforms are hand held devices. The basic theme involves slinging birds with different powers or abilities at targets to “destroy evil pigs” and rescue eggs or free other birds. Play can become addictive for some, and in one version (Angry Birds Friends) competition is allowed with friends. One obsessed fan conspired with the publisher to deliver an in-game marriage proposal (http://www.huffingtonpost.com/2013/05/03/angry-birds-proposal_n_3204489.html).

Angry Birds has won praise for successfully integrating addictive gameplay, humor, and low price. In many ways it provides a good example of the psychological underpinnings that successful video games use to attract and maintain players’ interest.

Those of us with memories of early console games such as Pong, Pac-Man, Space Invaders, and Donkey Kong will resonate with the play style and linear format of Angry Birds, and other level-by-level games. However, the marketplace has been over-run with newer interactive and web enabled games and consoles that allow for more sophisticated play and simulations.

These newer games often involve role-playing interactions that alter game outcome, apart from response speed and skill at manipulating input devices. For example, one type of game that involves intricate and sophisticated play is the massively multiplayer online game (MMOs).

MMO’s currently account for \$11 billion of the video game industry’s \$44 billion annual revenue (Barnett & Coulson, 2010). World of Warcraft, an MMO, has the highest player subscription ever recorded, with 11.5 million players as of November 2008 (decreased to 9.6 million in early 2013).

Many of the popular games involve graphic violence and “first person shooter” perspective. One of the pioneers of this genre is Grand Theft Auto (GTA). It first appeared in 1997 as a multi-platform game, and the latest version (Grand Theft Auto V, 2013) uses the Play Station 3 or Xbox 360 platforms.

The series belongs to a genre of video games sometimes called “sandbox games,” because they afford players a large amount of freedom to make choices that alter the game play and outcomes.

More traditional action games flow along a single track and series of increasingly challenging levels with linear game play. But in GTA, the player can select some roles and assignments. The player's relationships with other characters shift as a result of these choices. Players take on the role of a criminal or a wannabe in a large city, and attempt to rise through the ranks of organized crime over the course of the game.

Other popular games of this genre include Halo, Call of Duty, and a Tom Clancy series (Splinter Cell and Ghost Recon). Sports simulations such as Madden NFL and the Wii game series are also quite popular. Mobile phone games also include a wide array, from puzzle-like activity (e.g., Scrabble and Tetris) to the bizarre (e.g., fighting fruit ninja style, squishing insects, or growing amoeba-like organisms into top-of-the-food-chain predators).

The games range in price from free download versions to expensive software that require fast gaming computers or expensive consoles to operate.

Focusing on GTA and Angry Birds brings the contrast into sharp relief. The two games represent different ends of several continua, from tame to frankly violent, from free downloads to expensive purchases, and from simple to highly complex story lines and play. However, like all successful electronic games they rely on a set of psychological principles to attract users and sustain interest.

For example, according to Prensky (2007), video games are addictive partly because they offer a constant stream of feedback. Players instantly learn what works and does not work at each level, and subsequently use that knowledge to advance to more complex levels.

Video games also both teach a range of skills that may have positive value (e.g., hand-eye coordination and problem solving) or negative implications of varying degrees (e.g., time wasting or appearing to promote antisocial behavior). Parents who consider giving their children access to such games will almost certainly want to have some ability to assess and understand the nature of what the different games might teach or communicate to their children. Parents will also want to know about any potential benefits or hazards associated with such games.

Video games have become the preferred format for play among US youth, and reports indicate that 97% of all teenagers play video games (Ceranoglu, 2010). The Kaiser Family Foundation (KFF) has estimated that eight to eighteen years olds spend an average of 1.5 hours per day playing video or computer games (KFF, 2010).

This included 36 minutes a day playing console games, 21 minutes using hand-held gaming devices, 17 minutes playing computer games, and 17 minutes playing cellphone games in 2010. These numbers have continued to grow and the trajectory continues to accelerate. Given this amount of time, it seems critical for parents to find ways of becoming more informed consumers about the kinds of games, apps, and similar activities that absorb their children's time and potentially exert a lasting influence.

Regulation of Video Game Play

Video game play has been a part of the cultural scene at least since Atari introduced PONG (a simple two-dimensional tennis-like game) in 1975. The genre grew rapidly advancing from tame two-dimensional attempts to teach educational content and save the world from “space invaders,” to today’s multi-player, three-dimensional, role playing games with first person shooting views that involve graphic violence and other forms of anti-social activities.

Parents, professionals, and religious groups became concerned in varying degrees about an assortment of games, attributing all manner of bad outcomes, such as increased violence and aggression, to game playing. These led to various attempts to use government to restrict children’s access to such activities access.

One of the earliest efforts was argued before the Supreme Court in 1981 and decided the next year (*City of Mesquite v. Aladdin’s Castle, Inc.*, 1982). The metropolis of Mesquite, Texas, with a population of just over 100,000 people at the time, sought to ban children under age 17 from operating amusement devices unless accompanied by a parent or legal guardian expressing concern about some “possible connection with criminal elements.”

Writing for the majority, Justice Stevens noted the prohibition against allowing children under 17 years of age to operate the amusement devices unless accompanied by a parent or legal guardian was “without a rational basis.”

The latest case attracting significant judicial attention was decided June, 2011 when by a 7-2 vote the Supreme Court struck down a California law banning the sale of violent video games to children under age 18 (*Brown v. Entertainment Merchants Association*). The majority opinion authored by Justice Scalia read in part:

“This country has no tradition of specially restricting children’s access to depictions of violence...Certainly the books we give children to read—or read to them when they are younger—contain no shortage of gore. Grimm’s *Fairy Tales*, for example, are grim indeed. As her just deserts for trying to poison Snow White, the wicked queen is made to dance in red hot slippers ‘till she fell dead on the floor, a sad example of envy and jealousy.’ (*The Complete Brothers Grimm Fairy Tales*, 198, 2006 ed.) Cinderella’s evil stepsisters have their eyes pecked out by doves. And Hansel and Gretel (children!) kill their captor by baking her in an oven.”

In a certain twist of irony the initial plaintiff in the lawsuit was Arnold Schwarzenegger, acting in his capacity as then-governor of California. In his prior career as an actor Schwarzenegger had played many violent roles, including the lead in the *Terminator* franchise, which did have video-game spin-off products. He ultimately found himself attempting to limit access to that franchise in his role as governor.

The courts have, in essence, told us that government cannot act as some kind of super-parental guardian to protect children from exposure to such themes. It falls to parents to exercise that authority over their children to the extent they can.

These legal actions make it all the more important that parents have access to the means to make informed decisions about what is best for their children with regard to gaming activities and access.

A plethora of psychological research has attempted to provide parents and professionals with solid data on which to base their decisions. Findings are varied and difficult to interpret. In their excellent compilation (*Grand Theft Childhood: The Surprising Truth about Violent Video Games*) Lawrence Kutner and Cheryl Olson (2011) have presented a down to earth summary.

For example, they describe the findings of one study in which boys who played M-rated (for mature) games were twice as likely to get into a physical fight, steal, or struggle in school, but that most children who play M-rated games did not have serious problems.

How should we understand this? One plausible explanation: children who are already at risk, impulsive, prone to steal or act out, who have exposure to family violence, or who are failing in school may be drawn to the games, but we have no evidence that the game play causes or exacerbates their bad behavior in society at large, since so many players seem unaffected.

This seems yet another reason for parents, who know their children and their individual circumstances best, to make good decisions about what games are best for their children.



Psychological Fundamentals of Game Play

Certain psychological principles are well understood by successful electronic game designers. The ideal game, from a marketing perspective, is one that can engage the target population quickly and induce them to keep playing.

Psychologists who study the factors that shape human behavior would refer to these basic fundamentals of success for any electronic game as involving **ease of skill acquisition** (i.e., learning the basic skills needed to play and “win” easily and quickly), **engaging the player to maintain responding** (i.e., keep on playing), and **avoiding habituation** (i.e., getting bored and quitting).

Persistence in the game typically involves acquisition of points, badges of expertise, or completions of game levels. Developers encourage progression in the game by regularly rewarding the player, and this aspect of game design has been likened to Skinner’s (1938) behavior principles of reward for commitment.

The older and more mature the player, the longer they will persist at the game to acquire a reward. Part of this phenomenon is related to the increased patience and problem-solving orientation that comes with maturation.

On a broader level, many psychological theories also help explain the phenomenon. White's classic monograph on competence motivation and self-efficacy (1959) described **effectance motivation** (i.e., *the positive feelings people have, when they feel that they can influence their environment and life course*) as the "master reinforce" of our "ability to interact effectively with the environment."

There are two factors of game play that foster a sense of effectance in players. First, the immediacy of the feedback in games allows players a prompt and clear sense of competence with respect to gaining knowledge of how to play and making progress towards achieving higher levels of play.

Second, with just a few button clicks, players can have a significant impact on the outcome of a situation. The feeling of one's direct impact on the game stimulates the experience of being part of the game world. These feelings of effectance are very pleasurable and rewarding and thus engage players, enticing them to keep playing (Klimmt & Hartmann, 2009, ch. 10 in Vorderer & Bryant book)

Vygotsky (1978) described "zones of proximal development" where learning occurs due to observation and interactions that pull game players forward into more complex and demanding tasks. He also underscored ways that responsive feedback in game play along with social collaboration and communities provide a scaffolding that provides problem-solving and learning retention.

Harter (1987) integrated developmental perspectives to effectance motivation theory. Bandura and Schunk (1981) further advanced the model using the term **self-efficacy** to describe the same phenomenon. They also describe "proximal goal setting," by explaining how sub-goals that occur closely timed in space and action provide immediate incentives as powerful motivators.

In some games, players acquire a skill by trial and error, memory, or deductive problem solving. With other games, variable-ratio reinforcement comes into play. This term refers to a kind of **slot-machine mentality**. The player gets a reward based on a variable number of attempts regardless of skill.

Sometimes the player may get a reward after 5 attempts, but the next reward may not come for another 12 attempts. The interval between rewards varies in a manner unknown to the player. The need for trial and error practice, or a variable ratio reward, will both increase persistence.

But younger or more impatient players need more frequent rewards.

This kind of phenomenon has been associated with addictions, most notably gambling addictions. Some researchers have proposed that gaming might become addictive, though this view is increasingly less accepted. Instead, a growing body of research warns of the dangers of game dependency.

Game dependency occurs when playing games evolves beyond an interest and instead serves particular psychological and social purposes (Lee & Peng, chapter 22 in Vorderer, Jennings & Bryant, 2006). For example, when a child feels unsafe at school and is being bullied daily, a virtual community might be the only social environment in which he feels safe.

In this case, time consuming gaming does not represent an addiction per se, but rather an attempt to cope with an otherwise psychologically dangerous environment. In such situations, parents are encouraged to not simply take away the game, as that might cause further distress. *Instead, parents should explore with the child the reasons for the over-investment in the game.*

Social and Emotional Impact of Gaming: The Role of Development, Context, and Game Content

These factors can influence whether and how much media affects youth — in the research world, these are called **moderators and interaction effects**.

For example, in discussing the impact of violent media on children, the Surgeon General's (2001) report summed it up as follows: "Factors that appear to influence the effects of media violence on aggressive or violent behavior include characteristics of the viewer (such as age, intelligence, aggressiveness, and whether the child perceives the media as realistic and identifies with aggressive characters) and his or her social environment (for example, *parental influences*), as well as aspects of media content (including characteristics of perpetrators, degree of realism and justification for violence, and depiction of consequences of violence)."

Issues can evolve from the nature of the content and the manner in which that content can either teach positive lessons, or create a tolerance for problem behaviors. Most children develop a sound ability to differentiate fantasy from reality as they age, and those who integrate well in school, community, and family life will easily separate even the most realistic virtual worlds of gaming from their real lives.

For some children; however, disappointments or frustrations with aspects of their lives may make gaming a tempting escape that can have isolating and regressive effects.

Therefore, when making decisions about game consumption, parents and caretakers are encouraged to consider their children's developmental stage, individual characteristics, social environment, and specific aspects of the games.

Developmental Factors

Research has demonstrated that even in infancy children pay attention to, and seem to enjoy, changing visual stimuli, showing preferences for some images - such as faces - over geometric shapes.

Pre-verbal children (i.e., 0-2) enjoy interactive play and learn both language and non-verbal concepts by observing and listening. As they acquire language, mobility, and manipulative skills, toddlers and pre-school children (i.e., 2-4) are increasingly able to interact with touch-screen devices that may serve educational purposes.

Similar intellectual growth spurts take place as children enter the educational system. Conceptual abilities leap forward as children enter later childhood (e.g., 8-10) and adolescence (e.g., 12 and up) and develop deductive and hypothetical reasoning (i.e., the ability to ask themselves “what if...” questions and imagine the results of outcomes they have not previously encountered).

Engagement in electronic games will vary as a function of these developmental components. For younger children, the game will need to have a highly intuitive interface, and use language and concepts appropriate to the child’s language ability, hand-eye coordination, and other school readiness skills.

The visual and auditory stimuli must also be developmentally appropriate. For example, younger children may become startled by loud noises or frightening images that would not trouble adolescents. The earliest and most reliable component of startle is the **eye-blink reflex**, elicited by a sudden auditory or tactile stimulus. It is a functional measurement of developmental changes occurring in children.

There is a period of maturation around 7 months of age, but full maturation (more comparable to an adult response) may not be seen until about 8 years of age (Yoshida et al., 1997). Just as an invitation to sit on Santa’s lap or the appearance of a clown might delight some children but frighten others, so might the appearance of unexpected or startling images on an electronic device.

As children’s cognitive level advances, and high order thinking about the world comes into play, they are less likely to be emotionally destabilized for very long by startling noises. However, some imagery and content can create other problems.

For example, graphic depictions of violence or strong sexual content can trouble young viewers, particularly when they have no responsible adult to talk with about what they have encountered. The solitary nature of much game play potentially exposes many children to distressing content while the caring adults in their environment remain unaware of the exposure and potential distress or questioning triggered by it.

Boredom follows what psychologists would call **habituation**. The responding level of the player will decrease if the same result or outcome appears repeatedly. Another way to illustrate the principle involves becoming too familiar with a particular game or pattern of behavior so that it loses its original novelty. Some variation is necessary to maintain the player’s interest.

The level of sophistication needed to hold the player's interest will increase significantly as children get older. Another side effect of the same phenomenon involves changes in behavior that come with familiarity.

For example, as a parent, you might teach your child to say "please" and "thank you" to other adults. This may work very well with strangers or people with whom the child is relatively unfamiliar or who are encountered in formal situations, such as school.

However, it will come as no surprise when the child does not use the same verbal courtesies in dealings with parents or siblings, especially as they get older and the novelty of the lesson wears off. *Just as using positive behaviors can become boring and lose importance*, some researchers and parents fear that some habitual game playing may reduce normal social inhibitions against rude behaviors or violence.

In interactive game play an **anonymity effect** sometimes comes into play when people abandon their social skills amid the obscurity of identity that occurs in the digital universe. Children and adult game players may become more rude, use foul or offensive language, or otherwise exhibit bad behavior because they feel a degree of impunity through anonymity.

This occurs frequently in multi-player games, and can undermine parental efforts to convince their children that good citizens give consideration to others - even when no one can recognize them as the actors. Such behavior can also lead to a kind of slippage in children's social behavior, particularly in emotional or competitive contexts outside of the game.

For example, will repeated exposure to unsavory language and violent acts in video games lead to more spontaneous use of rude language and violent acts in real life? Most studies suggest that such risks are not significant hazards for normal older children and adolescents, who do seem well able to differentiate between gaming and the real world.

However, very young children who have not yet incorporated mature social or emotional restraint into their behavior patterns, or children with significant emotional or behavioral problems, may fall under greater adverse influence of repeated offensive language exposure or witnessing violent solutions to social challenges.

Positive Aspects of Video Gaming

Some games help develop hand-eye coordination, teach some laws of physics and geometry, teach problem solving via trial-and-error learning, encourage attention to detail, and allow hypothesis testing and deductive learning. For example, research shows that some games can facilitate spatial skills for boys and girls equally, and such results have been demonstrated from kindergarten through college age (Lee & Peng, ch. 22).

Children are growing up in a digital age where the more traditional presentation of information in printed material is replaced with multimedia formats. Therefore, some of these learning benefits

may result from children's "learning to learn" in new environments that include hypertext, visual cues, and simulation (Lee & Peng, ch. 22).

Scholars have identified theoretical models that account for the facilitation of learning while playing computer or video games. According to Hubbard, the learning process is due to the **immersion effect** (Khalil, 2012; Lee & Peng, 2006).

The immersion effect "creates an environment in which the players submerge themselves and progressively increase their attention and concentration on a goal" (Lee & Peng, p. 336). When players are deeply engaged in the learning environment, they become especially attentive to the educational material within the game.

The concept of flow has also been identified as related to learning in gaming. Flow is the "state of optimal experience whereby a person is so engaged in an activity that self-consciousness disappears, and the person engages in complex, goal-directed activities not for external reward, but simply for the exhilaration of doing" (Lee & Peng, ch. 22).

When players are in such a state, they are not passive, but instead are active learners who feel in control of their actions and outcomes in the game. The key to this challenge is to ensure the level of complexity matches the skills of the player. If the game is too easy, it will become boring. Conversely, if the game is too challenging, the player may become frustrated and give up. In either extreme, learning will not take place.

While more research is needed around the real-world application, or generalizability, of game-originated learning, some evidence suggests that if used in moderation, and under appropriate contexts, skills learned through games may enhance cognitive skills (e.g., interpreting and understanding scientific information) and sociability (Lee & Peng, ch.22).

A recent article examined how MMO players' leadership qualities might compare to those used in real-world situations. Four factors of leadership were examined, including sensemaking, inventing, relating, and visioning. These four factors were also found in MMO leadership related events.

Dr. Pamela Rutledge, Director of the Media Psychology Research Center, indicates that the experience of playing video games offers cognitive benefits, but it can also positively impact emotional well-being and self-efficacy in a number of ways:

- 1) The expansion and exploration of identity.
- 2) Generation of and participation in communities of learning.
- 3) Building social connections through collaboration and negotiation.
- 4) The promotion of problem-solving and decision-making in low-risk situations.
- 5) Development of intrinsic motivation, and
- 6) The creation of positive emotions.

(http://www.psychologytoday.com/blog/positively-media/201208/video-games-problem-solving-and-self-efficacy-part-2#_ENREF_12).

Advanced games that involve multiple players and team activity can also offer a virtual place for play, with socialization and group problem solving as positive results. For example,

www.whyville.net, a virtual cooperative learning site for children, engages users in multiple learning opportunities where they not only gain skills related to a particular topic (e.g., learning about different careers in CareerQuest) but also socialization opportunities where they can socialize with and learn about peers from all over the world.

Dr. Matthew Chow, a psychiatrist who studies gaming and behavior, posits that gaming can also promote pro-social behavior. When people join online virtual worlds and communities, they participate in “in pro-social behaviors such as cooperative play, trading, negotiating, forming alliances, and creating rules of conduct. You need to be able to get along with a diverse community in order to succeed in online play. Antisocial people are often marginalized and even banned from popular communities” (<http://www.nbcnews.com/technology/ingame/worried-about-your-childs-gaming-psychiatrists-say-play-them-1C7660207>)

Games are also increasingly used for therapeutic treatment of psychological (e.g., depression) and physical problems (e.g., rehabilitation). Games such as SPARX (www.sparx.org.nz) include elements of fantasy, challenge, and curiosity to help adolescents engage in cognitive behavioral treatment of depression.

Games such as ReMission are also used to help children with physical illness (i.e., cancer) and have been shown to increase knowledge of treatment, self-efficacy, and medication adherence (Kato et al., 2008).

Neutral Aspects of Video Gaming



When no learning or skill development opportunities occur, because the tasks at hand are simple or involve no progressive learning, little or no enduring benefit results. Still, people will sometimes engage in such activity as an alternative to while away time, when otherwise bored. Perhaps no bad influences occur, and a lot of time does not get siphoned away from important activities in such circumstances.

One might categorize such games as “no harm, no foul,” and some parents might regard them as mildly beneficial if they distract the child from boredom or other behaviors parents find annoying (e.g., provoking siblings). Visions of long car or plane rides, or waiting time in a doctor’s office come to mind, and such games can yield a moment of gratitude for mild distraction.

While already “killing some time,” though, why not enhance the neutral game-based experience by adding a positive relationship-based experience? When parents and caretakers become well-versed in what apps or games allow for additional engagement through questioning or story- telling, for example, they can use the game as a springboard for fun, interactive experiences with children and adolescents.

Potential Negative Aspects of Video Gaming

While aggressive behaviors triggered by violent games have been the primary focus of studies on the potential negative aspects of video gaming, it is important to also consider other facets of gaming that may pose negative effects.

For example, at the level of younger children, do they create nightmares with scary sounds and images or induce anxiety by raising frightening themes? In a recent study evaluating children's (between the ages of 4 and 6) night time fears, researchers at Tel Aviv University found that while most children grow out of night time fears on their own, for some these fears persist, posing a risk for the development of anxiety problems later in life.

What was most notable among these preschoolers with persistent nighttime fears was that they were far less able to distinguish reality from fantasy compared to their peers (<http://psychcentral.com/news/2012/11/14/fantasy-reality-confusion-fuels-kids-nighttime-fears/47657.html>).

Therefore, for children who are already susceptible, games with scary sounds, images, and that are less distinguishable in the continuum between fantasy and reality may contribute to increased fears and anxiety.

For older children, important questions to consider include: do the games become a **time sink** distracting from schoolwork or other priority activities? Do they promote **social stereotypes**, as when GTA includes street wars between Haitian and Cuban immigrants?

Do they make players more **tolerant of foul language, bullying, or other problem behaviors**? According to Common Sense Media (2012), one in four teen social media users say they "often" encounter some type of hate speech online, such as racist, sexist, or homophobic remarks, but it is not clear what portion of that includes threats or discussions of physical violence.

Games that promote negative stereotypes based on race, gender, or sexuality may continue to reinforce these negative messages.

One significant feature is **gender stereotyping**, although there are signs of change in this regard for some games, including creation of a heroine who saves Super Mario and revisions to the Legend of Zelda wherein she takes on the heroic roles, as opposed to the damsel in distress (See, for example: <http://online.wsj.com/article/SB10001424127887323300004578559570373710646.html> and <http://www.dailymail.co.uk/femail/article-2292180/Daddy-I-want-save-Mario-Three-year-old-girls-wish-comes-true-father-hacks-Donkey-Kong-make-Pauline-heroine.html>).

Games aimed at older audiences where the prime demographic target is adolescent males still tend to portray females as highly sexualized stereotypes.

Although many players report that they enjoy the surprise elements of player versus player (PvP) server based gaming, and will often engage in full-scale battles with the opposing faction, a small body of players take PvP too far. Known as **griefers**, these players enjoy participating in

antisocial behaviors that disrupt the enjoyment of the game for other players on the receiving end (e.g., targeted bullying) (Foo & Koivisto, 2004.)

A news report by Pham (2002) suggests that the number of players affected by griefers is very high. Research on griefing is still in its infancy. However, Foo and Koivisto (2004) explained that players may act out in this way for many reasons, such as feeling bored, or seeking a sense of accomplishment at the expense of others.

Additionally, successfully killing another player's character may provide a sense of being powerful or a sense of identity with other PvP players. A player of the opposing faction will be seen as the enemy, and in this sense, attacking that player may provide a sense of group role play achievement which enhances the sense of immersion in the game world.

Importance of Parental Involvement in Children's Gaming

Other research has identified family influences as central to the relationship between video games, motivation and behavioral outcomes. For example, Ferguson and Garza (2011) found that children who played violent games along with their parents had the most positive outcomes related to prosocial and civic behaviors, compared with non-gamers or children who played violent games alone.

While the exact reasons for such findings are still under study, addressing parental concerns on video games and providing guidance around impact of game play on child's socialization is important (Ceranoglu, 2010).

It may be that parents who are well informed about the games their children play may feel more empowered to make decisions about restricting or allowing play based on a realistic view of the game, coupled with an understanding of their children's developmental level, characteristics, and preferences.

As such, it may be particularly important to consider family input variables as a focus of study routinely in video game research. **It is also important to have tools available to help parents make educated decisions about their children's gaming.**

An important part of cognitive development for children is the conceptualization of cause and effect and goal-directed behavior. Developing an understanding that the child's own actions have consequences is a necessary building block to the growth of self-efficacy and resilience. (http://www.psychologytoday.com/blog/positively-media/201208/video-games-problem-solving-and-self-efficacy-part-2#_ENREF_12)

Parents should ask themselves why their child is playing a particular game, and remain mindful of such motives. If the goal of the child's behavior seems aimed at avoiding something or someone, that may be a cause for concern. On the other hand, a game aimed at recreation or skill acquisition can prove beneficial.

Parents should get to know their child's interests and gaming motives. Parents should also get to know people with whom their child is interacting online.

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