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Parenting paused: Pathological video game use and parenting outcomes[☆]

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ABSTRACT

For most people, playing video games is a normal recreational activity, with little disruption to gamers' emotional, social, or physical health and well-being. However, for a small percentage of gamers, video gaming can become pathological (Fam, 2018). Substantial research has examined pathological gaming in teens and young adults (Cheng, Cheung, & Wang, 2018; Choo, Gentile, Sim, Khoo, & Liau, 2010), yet pathological gaming in adults (c.f. Holgren, 2017), especially in the context of parenthood, has been relatively ignored. The current study sought to address this limitation by studying associations between pathological gaming characteristics and parenting outcomes in a sample of men and women who have had a child in the last year. Fathers spent more time than mothers playing video games and displayed more pathological video gaming tendencies. Pathological gaming for mothers and fathers was related to increased depressive symptoms. Depressive symptoms mediated the relationship between pathological gaming and decreased feelings of parental efficacy, perceived parental competence, increased parenting stress, and increased perceived impact of parenting. Pathological video game playing was also directly related to decreased feelings of parental efficacy for mothers and fathers. Implications of the results and directions for future research are discussed.

1. Introduction

Since the 1980's, video games have exploded in worldwide popularity and become a several billion dollar a year industry (Bacon, 2011; Johns, 2006; Stratista, 2011). For most people, playing video games is a normal recreational activity, with little disruption to gamers' emotional, social, or physical health and well-being. However, for a small percentage of gamers, video gaming can become pathological (Cheng, Cheung, & Wang, 2018p; Fam, 2018). Pathological gaming is characterized by excessive time spent playing video games, playing interfering with work or social relationships, difficulty disengaging from video games, and feeling a compulsion towards gaming. Pathological game use (also called Internet gaming disorder) and has been compared to other behavioral addictions or compulsions such as gambling (Wittek et al., 2015) and was recently listed by the World Health Organization as a mental health disorder (WHO, 2018). With the rise in video game use, researchers have spent considerable resources examining the predictors and outcomes of pathological gaming. Substantial research has examined pathological gaming in teens and young adults (Choo, Gentile, Sim, Khoo, & Liau, 2010; Gentile, 2009), yet pathological gaming in adults (c.f. Holgren, 2017), especially in the context of parenthood, has been relatively ignored. The current study seeks to address

this limitation by studying associations between pathological gaming characteristics and parenting outcomes in a sample of men and women who have had a child in the last year.

2. Pathological video game use

Pathological video game use is fairly rare, only accounting for approximately 3 to 6% of adolescents who play video games (Fam, 2018; Gentile, 2009). As adolescents enter emerging adulthood, this percentage rises to approximately 8 to 12% of all video game players (Fam, 2018; Grüsser, Thalemann, & Griffiths, 2007; Paulus, Ohmann, von Gontard, & Popow, 2018). This prevalence rate (generally between 3 and 6% depending on the age group being examined) has been found cross-culturally and appears to be relatively stable over the last decade (Cheng et al., 2018; Choo et al., 2010; Lopez-Fernandez, Honrubia-Serrano, Baguley, & Griffiths, 2014; Paulus et al., 2018). Adolescent and young adult who use video games at pathological levels perform worse academically, display increased attention problems and impulsivity, display poorer social competence, and increased depression and anxiety (Brunborg, Mentzoni, & Frøyland, 2014; Cheng et al., 2018; Gentile et al., 2011; Gentile, 2009; Paulus et al., 2018). Recently, researchers have pointed to biological risk factors to pathological gaming (Coyne

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et al., 2015; Dong et al., 2018; Han et al., 2007; Han, Hwang, & Renshaw, 2011; Wang et al., 2018), with the most commonly studied factors being poor impulse control, need for reward, and difficulty persisting in challenging or boring cognitive tasks.

Researchers have repeatedly shown that being male is a risk factor to pathological gaming (Fam, 2018; Gentile et al., 2011; Gentile, 2009; Mentzoni et al., 2011), but others have argued that as women increasingly spend time playing video games these gender differences will disappear (Griffiths, Kuss, & King, 2012). Stereotypes of gamers as adolescent and emerging adult, single males persist, but the reality is that adults are continuing to play video games throughout their lifetimes (Osmanovic & Pecchioni, 2015; Wittek et al., 2015) and that the majority of video game players are now over eighteen (Fam, 2018). Wittek et al. (2015) found that younger individuals were more likely than any other age group to display pathological video gaming tendencies, but this group of “younger individuals” ranged from 16 to 30 years old. Likewise, researchers have shown that video game play is common in adult romantic relationships with couples between the ages of 20 and 35 (Ahlstrom, Lundberg, Zabriskie, Eggett, & Lindsay, 2012; Coyne et al., 2012). Indeed, the average age of first childbirth is 26 years (Stone, 2018), well within the age range of people the most likely to display pathological gaming tendencies and most men who have children had their first child before the age of 30 (Livingston, 2015). Perhaps the stereotype of young, single, male, video game players is why researchers have failed to examine pathological gaming related to parenting attitudes and behaviors, such as parental efficacy, parental stress, and parental competence.

3. The influence of parental efficacy, competence, perceived impact of parenting, and stress on parental health, behavior, and child outcomes

Parents and their behavior play an important role in their child's social, emotional, and physical development. How parents perceive themselves as caretakers and active agents in their child's development greatly influence the quality, quantity, and tone of parent-directed interactions with their children. For the purposes of the current study, we focused on the parenting behaviors and perceptions of perceived parental efficacy, perceived parental competence, parenting stress and perceived impact of parenting.

3.1. Parental efficacy and competence

Perceived parental efficacy, or “the beliefs and judgments a person holds of their capabilities to organize and execute a set of tasks related to parenting a child” is important for child developmental outcomes (Bryanton, Gagnon, Hatem, & Johnston, 2008; de Montigny, 2005 pp. 387; O'Neil, Wilson, Shaw, & Dishion, 2009). Researchers have repeatedly shown an association between perceived parental efficacy and children's better academic performance (Ardelt & Eccles, 2001), beliefs about their own ability to influence the future for good (Perrone, Sullivan, Pratt, & Margaryan, 2004), and better social and emotional health in children (Jones & Prinz, 2005; Kohlhoff & Barnett, 2013). This is likely due to better parenting behaviors by the parents themselves. Researchers have shown that parents who have higher perceived parental efficacy monitor their children more (Shumow & Lomax, 2002), engage in more age appropriate activities with their children (Leahy-Warren, McCarthy, & Corcoran, 2009), use warmer and more supportive language with their children, and use less harsh or punitive discipline methods (Hess, Teti, & Hussey-Gardner, 2004; Sanders & Woolley, 2004). Taken together these studies suggest that parents who have higher perceived parental efficacy engage in more effective parenting with their children which is related to better child outcomes. This relationship seems to be particularly true for at-risk children and families (Ardelt & Eccles, 2001).

Perceived parental competence, or an individual's perception that

they have adequate knowledge regarding child development, is highly related to, but distinct from, perceived parental efficacy (de Montigny, 2005). Perceived parental competence focuses on if the parent knows the norms, patterns, and behaviors related to optimizing their child's developmental outcomes, while parental efficacy focuses on if the parent feels they can act on their knowledge. Like parental efficacy, perceived parental competence has been related to child development outcomes. Parents with greater perceived parental competence have children with improved cognition (Coleman & Karraker, 2003) and have more positive feelings towards their children (Copeland & Harbaugh, 2004). Parental competence has also been related to decreased frustration with infants (Denis, Ponsin, & Callahan, 2012), better sleep for parents and children during infancy (Wolfson, Lacks, & Futterman, 1992) and decreased postpartum depression (Liu, Chen, Yeh, & Hsieh, 2011). Social and emotional support has been highly correlated with perceived parental competence, with parents with more support feeling more competent in their parenting roles (Bornstein et al., 2003; Ngai, Wai-Chi, & Ip, 2010; Tarkka, 2003).

3.2. Parental stress, perceived impact of parenting, and depression

While perceived parental efficacy and competence have been related to positive parenting behaviors and child outcomes, parenting stress and difficulties in the adjustment to parenting (e.g., perceived impact of parenting) have been related to negative child outcomes. Stress directly related to parenting has been associated with a host of negative outcomes including less supportive and instructive play between parents and young children (Anthony et al., 2005; Rodgers, 1998), more punitive and harsh interactions between parents and children (Rodgers, 1998), and poorer social and cognitive development in young children (Anthony et al., 2005). Like parental perceived competence and efficacy, parental stress likely influences child development indirectly through parenting behavior, with parents who are more stressed engaging in less warm, supportive, effortful, and effective behaviors with their children, which in turn leads to poorer social, emotional, and cognitive outcomes in their children (Crawford & Manassis, 2001; Crnic, Gaze, & Hoffman, 2005). Parents who report more negative impact of parenting also display more parenting stress (Jackson & Huang, 2009) and poorer interactions with children (Jackson, 2000).

Parental depression, and in particular, maternal depression, is a well-established risk-factor for child development (Rahman, Harrington, & Bunn, 2002). Researchers have repeatedly shown that parental depression is related to poorer parent-child attachment (McMahon, Barnett, Kowalenko, & Tennant, 2006), more difficulty adjusting to parenting, increased parenting stress (Jackson & Huang, 2009), and feelings of frustration with children (Hanington, Ramuchandani, & Stein, 2010), poorer child emotional and social development (Murray & Cooper, 1997), and poorer quality interactions between parents and children (Gunlicks & Weissman, 2008). Researchers have repeatedly shown a relationship between pathological gaming tendencies and depression (Brunborg et al., 2014) and longitudinal research suggests that pathological gaming tendencies are related to increased depressive symptoms across time (Gentile et al., 2011). Therefore, depression will be treated as an outcome of pathological gaming tendencies in the current study and will be explored as a mediator between pathological video game tendencies and parental efficacy, competence, perceived impact of parenting, and parenting stress.

4. Parenting and pathological video game use

The current study will examine the influence of pathological gaming characteristics on parental efficacy, competence, impact of parenting, and stress as mediated by depression in a sample of men and women who have had a child in the last year. To our knowledge, there has been

no study on the association between pathological gaming and parental outcomes. However, there is reason to hypothesize that gaming and parenting attitudes and behaviors would be related. First, according to the displacement hypothesis (e.g., Lin, 1993) the time spent playing video game may displace parenting behaviors in general, increasing the likelihood that parents would feel less competent and effective as parents. Playing video games may also represent a form of “technoference”, where technology interferes with the ability to parent effectively (e.g., McDaniel & Coyne, 2016; McDaniel & Radesky, 2018; Stockdale, Coyne, & Padilla-Walker, *in press*). Parents who use video games at pathological levels may be distracted in their parenting, perhaps trying to play video games while they parent, leading to diminished feelings of parental efficacy and competence and higher levels of stress. In other words, video games may interfere with or displace parenting behaviors if a parent chooses to play video games instead of or during the time they are with their children.

Additionally, parenting may “interfere” with an individual’s opportunity to play video games. Parenting very young children takes a large amount of time, energy, and effort. If a parent uses video games at a pathological level - where they truly feel a compulsive need to play and withdrawal symptoms when they are unable to play, parents may begin to resent interruptions to gaming specifically caused by children, leading to more parental stress and possibly depression.

The following hypothesis will guide the study:

Hypothesis 1: Pathological gaming characteristics in mothers and fathers will be related to decreased feelings of parental efficacy and competence, mediated through increased depressive symptoms.

Hypothesis 2: Pathological gaming characteristics in mothers and fathers will be related to increased parenting impact and increased parenting stress mediated through increased depressive symptoms.

Hypothesis 3: Parental depression will be related to increased pathological gaming characteristics.

5. Method

5.1. Participants

The participants for this study were taken from Project M.E.D.I.A., which is an ongoing, longitudinal study of media and child development. 481 mothers participated in this study with their children who were all under one-year old. Children averaged 5.83 months (SD = 3.50 months). When a father was in the home ($n = 374$), they were also invited to participate. Mothers averaged 30.97 years old (SD = 7.76) and fathers averaged 32.44 years (SD = 6.54). For ethnicity, 70% of mothers were of European American ethnicity, 7.5% were Black, 15.6% Hispanic, approximately 3% were Asian American, and 4.2% were multiracial. For fathers, 73.4% were of European American ethnicity, 7% were Black, 13.7% Hispanic, less than 1% were Asian American, and 5.3% were multiracial. In terms of parental education, 56.1% of mothers and 51.9% of fathers had a bachelor’s degree or higher. For income categories, 14.8% made less than \$25,000 per year, 18.1% made between \$25,000 and \$50,000 a year, 38.1% made between \$50,000 and \$100,000, and 29.2% made over \$100,000. 75.4% of the mothers were married, 8.8% were single, never married, 14.2% were living with an unmarried partner, and less than 2% were divorced, widowed, or separated. Approximately 37% of the mothers in this study had received public assistance in the last year.

5.2. Procedure

Participant families for Project M.E.D.I.A. were recruited from a large mountain west city and were surveyed from May 2017 to September 2018. Participants were primarily recruited through mailers sent to the participants home through the Colorado Office of Health and Vital Records. The state of Colorado tracks live births within the state

and records primary caregivers address, ethnicity, and household income. Letters were sent to individuals within the Denver metro area who had a child within the last year. Approximately 10% of letters were returned due to incorrect addresses. Research assistants were then sent to potential participants homes to invite them to participate. 66% of participants who research assistants were able to reach at home and qualified to participate in the study agreed to participate. Additional participants were recruited through multiple methods including flyers in pediatrician offices, free clinics, social services office, businesses focused on entertainment for young children, public parks and play spaces.

6. Measures

6.1. Video Game use

Participants reported the amount of daily time they spent playing video games (including console, internet, and cell phone-based video games) on a 6-point Likert scale from 1 (*not used*) to 6 (*more than 4 h*).

6.2. Pathological video game use characteristics

Pathological video game use was assessed using the 9-item dichotomous version of the Internet Gaming Disorder Scale (Lemmens, Valkenburg, & Gentile, 2015). The Internet Gaming Disorder scale is based on DSM-5 criteria for internet addiction including preoccupation, tolerance, withdrawal, persistence, escape, problems, displacement, and conflict. Participants were asked to respond to the questions on their video game usage in the last twelve months. Example items include “Have you lost interest in hobbies or other activities because gaming is all you wanted to do?” and “Have you had arguments with others about the consequences of your gaming behaviors?” Items are summed, and higher scores are indicative of more pathological gaming. Reliability tests for this sample produced a Cronbach’s Alpha of 0.81.

6.3. Perceived parental efficacy

Parental efficacy was measured using an adapted version of the Parenting Sense of Competence Scale (Pedersen, Bryan, Huffman, & Del Carmen, 1989) to reflect parental attitudes towards perceived self-efficacy (Porter & Hsu, 2003). The scale consistent of 16 items on a seven-point Likert scale from 1 (*Not at all representative of me*) to 7 (*Strongly representative of me*) that pertain to parents’ perceptions of their competence on basic skills required in caring for an infant. All items are summed, with greater scores being indicative of greater feelings of efficacy. Example items include “In most circumstances, even when I am tired, I am able to cope well with meeting my baby’s needs” and “I feel I have caught on quickly to the basic skills of caring for my baby.” Reliability tests for this sample produced a Cronbach’s Alpha of 0.76

6.4. Perceived parental competence

Parental feelings of competence in caretaking for their infant was measured using a revised, seventeen item version of the Perceived Maternal Parenting Self-Efficacy Scale (PMP S-E; Barnes & Adamson-Macedo, 2007). Items were measured using a four-point Likert scale from 1 (*Strongly Disagree*) to 4 (*Strongly Agree*). Items are summed, and higher scores indicate greater competence in caretaking for infants. The overall measure was found to be reliable ($\alpha = 0.92$). Example items include “I am good at soothing my baby when he/she becomes upset” and “I am good at understanding what my baby wants.”

6.5. Perceived impact of parenting

Perceived impact of parenting was measured using an adapted version of the Perceived Life Changes scale (PLC; Lampic, Svanberg,

Karlström, & Tydén, 2006). This six-item scale assessed varying aspects of life that may be altered due to the birth of a child. Participants were asked to rate how much they agree or disagree with several statements of ways in which becoming a parent influenced them. Responses were on a four-point Likert scale from 1 (*Strongly disagree*) to 4 (*Strongly agree*), with higher scores indicating more perceived changes to life as a result of becoming a parent. Example items include “I have less time to devote to work and a career” and “There are strains on my relationship with my partner.” Reliability tests for this sample produced a Cronbach’s Alpha of 0.53.

6.6. Parenting stress

Parenting stress was measured using the Parenting Stress Index—Short Form (PSI; Abidin, 1990). This 36-item measure provides an overall measure of stress related to parenting and had participants rate on a five-point Likert scale from 1 (*strongly agree*) to 5 (*strongly disagree*). Items are reverse coded and summed so higher scores indicate higher stress levels. Example items include “My child turned out to be more of a problem than I expected” and “My child rarely does things that make me feel good.” This widely used scale displayed adequate reliability ($\alpha = 0.82$).

6.7. Depression

Depression was measured using the 10 item Center for Epidemiological Studies Short Depression Scale (CES-10; Levine, 2013). Participants answered statements regarding their own feelings and behaviors in the last week on a four-point Likert scale from 1 (*Rarely or none of the time (less than 1 day)*) to 4 (*All of the time (5–7 days)*). Higher scores are indicative of more depressed symptoms. Items are summed Scores of ten or higher are considered sufficient for clinical depression. Example items include “I could not “get going” and “I felt depressed.” Cronbach’s alpha reliability was 0.72

7. Results

7.1. Descriptive statistics

Table 1 presents the means and standard deviations for all study variables for mothers and fathers. Approximately 30% of mothers ($N = 144$) and 56% ($N = 100$) of fathers reported playing video games. Mothers spent, on average, less than thirty minutes per day playing video games and fathers spent a little over thirty minutes per day playing. Independent samples t-tests were run to examine differences between mothers and fathers for all study variables. Mothers spent significantly less time per day playing video games than fathers ($t(847) = 6.31, p < .001$). Mothers reported significantly greater perceived impact of parenting than fathers ($t(851) = 3.41, p = .001$), greater perceived parental competence ($t(850) = 10.80, p < .001$), greater perceived parental efficacy ($t(850) = 8.21, p < .001$), and

Table 1
Means and standard deviations for all study variables.

	Mothers Means(SD)	Fathers Means(SD)
Video Game Play**	1.62(1.16)	2.18(1.44)
Pathological Gaming**	0.82(1.10)	1.70(1.78)
Depression	6.06(4.40)	5.67(4.05)
Impact of Parenting**	13.91(2.39)	13.31(2.72)
Parenting Stress	254.76(14.65)	253.78(15.23)
Parental Efficacy**	92.23(9.65)	86.50(10.65)
Parental Competence**	56.72(5.71)	52.23(6.40)

Notes. ** Independent samples t-tests significant differences between mothers and fathers $p \leq 0.001$.

less pathological gaming characteristics ($t(335) = 5.02, p < .001$). There were no significant differences between mothers and fathers in perceived parenting stress ($t(845) = 0.87, p = .44$) or depression ($t(851) = 1.33, p = .18$). Table 2 presents bivariate correlations for all study variables for mothers and fathers.

8. Pathological gaming characteristics as a predictor of parenting related outcomes

We used structural equation modeling (SEM) in Amos 25 (Arbuckle & Wothke, 1999) to examine whether pathological video gaming characteristics was associated with parenting outcomes, as mediated by parental depression. MacCallum, Widaman, Zhang, and Hong (1999) stated a recommendation of ten participant cases per estimation in order to achieve appropriate power for SEM models. However, more research has suggested that sample size requirements are highly variable due to the percentage of variance explained in the model and estimated error of the measures used within the model (Wolf, Harrington, Clark, & Miller, 2013). While the current study employs a sample size large enough to meet traditional criteria for SEM, the use of self-report measures carries biases and measurement error. As such, the authors chose to employ a path analysis approach to SEM, using average scores in place of latent variables within the model in order to increase power and reduce the potential influence of measurement error within the model (Kline, 1991). A Monte Carlo study with 10,000 replications was employed in MPlus in order to examine the power of the current model given the sample size (Muthén & Muthén, 2002). The model showed adequate power with 22 parameters for mothers and fathers. For mothers, 13 parameters were above 0.85 and all parameters were greater of equal to 0.50. For fathers, 21 parameters were above 0.85 and all parameters were above 0.74, suggesting adequate power for the proposed model. The model showed adequate fit ($\chi^2(6) = 8.99, p = .17$; CFI = 0.99, RMSEA = 0.02). Due to the differences between mothers and fathers in outcome variables, a chi-square difference test was run to examine if models should be treated separately for mothers and fathers. The chi-square difference test was significant (difference = 29.40, $p < .001$) and thus models were run separately for mothers and fathers. The model showed adequate fit for mothers ($\chi^2(3) = 3.34, p = .34$; CFI = 0.99, RMSEA = 0.02) and fathers ($\chi^2(3) = 1.03, p = .79$; CFI = 1.0, RMSEA < 0.001). Fig. 1 shows the model with standardized path estimates for mothers and fathers.

Pathological video game tendencies were directly related to decreased feelings of parental efficacy for mothers ($\beta = -0.16, p < .05$) and fathers ($\beta = -0.12, p < .05$). Pathological video game tendencies were also related to depressive symptoms in mothers ($\beta = 0.38, p < .01$) and fathers ($\beta = 0.26, p < .01$). For both mothers, and fathers, depression was related to decreased perceived parental efficacy ($\beta = -0.27, p < .01$; $\beta = -0.36, p < .01$), perceived parental competence ($\beta = -0.24, p < .01$; $\beta = -0.22, p < .01$), increased perceived impact of parenting ($\beta = 0.31, p < .01$; $\beta = 0.28, p < .01$), and increased parenting stress ($\beta = 0.49, p < .01$; $\beta = 0.53, p < .01$).

To examine indirect effects, we conducted bootstrapping analysis based on 2000 bootstrap resamples and 95% confidence intervals. Bootstrapping showed with 95% confidence that depression mediated the relationship between pathological video game tendencies and perceived parental competence (mothers’ standardized indirect effect $\beta = -0.23, p = .03$, CI: $-0.42, -0.03$; fathers’ standardized indirect effect $\beta = -0.10, p = .002$, CI: $-0.23, 0.04$), perceived impact of parenting (mothers’ standardized indirect effect $\beta = -0.36, p = .01$, CI: $-.21, -.48$; fathers’ standardized indirect effect $\beta = 0.07, p = .04$, CI: $0.005, 0.20$), and parental stress (mothers’ standardized indirect effect $\beta = 0.39, p = .02$, CI: $0.09, 0.61$; fathers’ standardized indirect effect $\beta = 0.19, p = .008$, CI: $0.06, 0.31$). The direct effects between pathological video game tendencies and perceived parental efficacy for mothers and fathers does not necessarily mean this effect is partially

Table 2
Correlations between all study variables for mothers and fathers.

Mothers	2	3	4	5	6	7
1. Pathological Gaming	0.15	0.26**	-0.19*	-0.32****	0.23**	0.39**
2. Frequency VG Play		-0.05	-0.01	0.07	-0.03	0.08
3. Impact of Parenting			-0.29**	-0.32**	0.34**	0.31**
4. Parental Competence				0.61**	-0.34**	-0.24**
5. Parental Efficacy					-0.44**	-0.33**
6. Parenting Stress						0.49**
7. Depression						
Fathers	2	3	4	5	6	7
1. Pathological Gaming	0.38**	0.11	-0.10	-0.27**	0.25**	0.29**
2. Frequency VG Play		-0.08	0.03	-0.03	0.09	0.15**
3. Impact of Parenting			-0.28**	-0.39**	0.39**	0.28**
4. Parental Competence				0.61**	-0.36**	-0.22**
5. Parental Efficacy					-0.48**	-0.39**
6. Parenting Stress						0.53**
7. Depression						

Notes: ** $p < .001$.

mediated. Rather, it is likely that there exists a second mediator that further contributes to the relationship between pathological video game tendencies and parental efficacy (Zhao, Lynch, & Chen, 2010). See Fig. 1 for all paths, correlations, and standardized path estimates.

9. Discussion

The demographics of who plays video games has changed in the last decade (Fam, 2018). The stereotype of playing video games being an activity for children, teens, and emerging adult males is being challenged, as increasingly people who played video games as children and teens enter adulthood and continue gaming. In the current study, adults were included in the study who had had a child in the last year. The majority of fathers played video games and reported playing a little

over thirty minutes per day. Thirty percent of mothers played video games and reported playing under thirty minutes a day on average. The current data supports the assertion that people are playing video games well into adulthood (and specifically parenthood) and points to the need to examine the influence of video game play on a wider variety of outcomes related to adult roles.

The current study sought to begin this line of research by examining the influence of pathological gaming characteristics on parenting outcomes in a sample of mothers and fathers who had a child in the last year. Specifically, pathological video gaming characteristics were directly related to decreased feelings of parental efficacy for mothers and fathers. Pathological gaming characteristics include difficulty disengaging from gaming, feeling distracted by gaming and a compulsion to continue playing games. It is possible that these characteristics distract

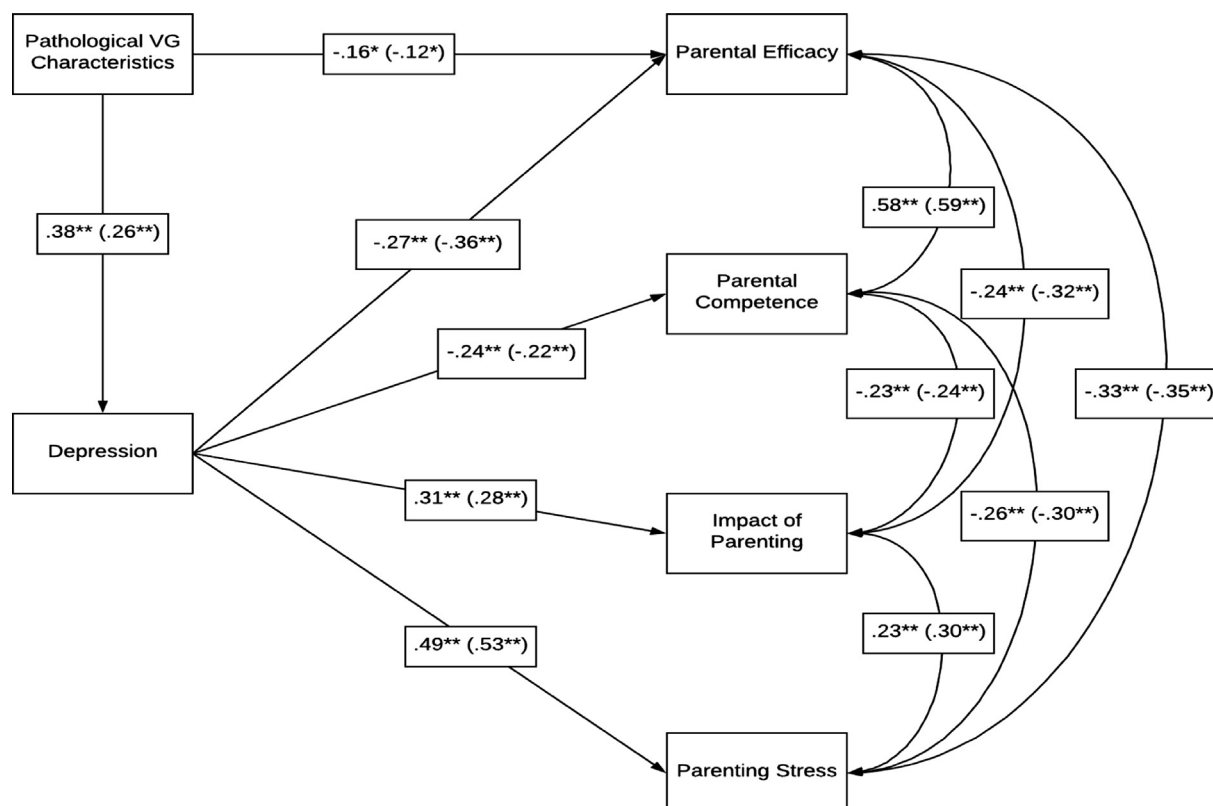


Fig. 1. Parental Depression and Pathological Video Game Characteristics Predicting Parenting Outcomes. Notes: ** $p < .01$ * $p < .05$. Mothers (Fathers) standardized beta weights and standardized correlations.

parents from engaging with their children, either if parents are thinking about or playing video games while in the presence of their children. This distraction may lead parents to miss important cues and signals from their children and may result in parents responding only after the child's behavior has escalated. Radesky et al. (2014) found that parents who were distracted by their cell phones during a meal were more likely to respond harshly to children, after missing repeated cues and bids from children for attention. Children were also more likely to display disruptive behavior in order to get their parents attention when their parents were highly involved with their cell phone (McDaniel & Radesky, 2018). Though we didn't measure whether infant behavior was more disruptive, it is possible that parents with more pathological gaming tendencies may be more distracted and missing early cues from infants. As a result, parents may not intervene until infant behavior has escalated. Calming or attending to the needs of an infant who has escalated is not as easy as attending to the needs of an infant who is displaying early cues of needing intervention or attention. As a result, later responding may lead these parents to feel less effective in their parenting role.

Pathological media use was also positively associated with depression for both mothers and fathers. This is consistent with a number of studies examining these associations in emerging adulthood (e.g., Lopez-Fernandez et al., 2014; Fam, 2018) and adolescence (e.g., Brunborg et al., 2014). Researchers have argued that depression is both a risk-factor to pathological gaming (Mentzoni et al., 2011) and an outcome of pathological gaming (Cheng et al., 2018; Gentile et al., 2011); however, more longitudinal research is needed to disentangle the time-course of the relationship between pathological gaming characteristics and depression. To our knowledge, this is the first study to show that pathological video game use is associated with depression in parents of young children.

Additionally, the relationships between pathological video game use and parental outcomes did not appear to differ between mothers and fathers, even though fathers play significantly more video games and show much higher levels of pathological video game use. This suggests that video game play can interfere with parenting regardless of gender. Parents may wish to reflect on their current video game use when considering how media might be related to parenting behaviors.

In line with past research (Jackson, 2000), parental depression was related to decreased feelings of parental competence, efficacy, increased feelings of parental stress and impact of parenting in mothers and fathers. Parental depression has repeatedly been shown to be a risk factor to optimal child development (Rahman et al., 2002), with parental depression being related to poorer parent-child attachment (McMahon et al., 2006), and poorer child cognitive and emotional development (Murray & Cooper, 1997). The majority of research regarding parental depression has focused on mothers. The current study adds to the growing body of research suggesting that paternal depression is also related to negative parenting outcomes in fathers (Cummings, Keller, & Davies, 2005). Important for the current study, depression mediated the relationship between pathological video game tendencies and all parenting outcomes. In other words, depression may be one explanation for why pathological video game use might be related to negative parenting outcomes.

The current study has a number of strengths, including examining pathological video game use in a relatively large sample of both fathers and mothers. However, there are a number of limitations. For example, the data was cross-sectional so it is impossible to determine directionality. While some researchers have argued that structural equation modeling should not be employed with cross-sectional data as causality cannot be determined (Maxwell, Cole, & Mitchell, 2011), we believe that this approach to structural equation modeling is unnecessarily rigid and limiting. In fact, using this approach to structural equation modeling would limit research to only using SEM in experimental designs, where causality can be determined and all confounding variables controlled. Yet, past researchers have repeatedly shown the validity of

using SEM for cross-sectional and longitudinal research, when the results are interpreted appropriately and with appropriate caution (Berlin, Williams, & Parra, 2014). Future researchers should examine the relationships between pathological gaming characteristics and parenting outcomes longitudinally in order to better disentangle the relationships between parenting outcomes and pathological gaming. It may be that parents who are overwhelmed with parenting and do not feel effective in their parenting roles may turn to video games as a way of coping or escape. Furthermore, the current study used self-report measures for all variables. Future researchers could use observational measures to examine parental outcomes and their relation to pathological gaming characteristics. Given these limitations, the current study is still an important first step in examining the potential relationships between problematic video gaming tendencies and parenting outcomes for parents with young children.

For the majority of people who play video games, playing video games is a normative recreational activity. However, for a small percentage of gamers, playing video games becomes pathological and can interfere with their daily functioning (Gentile, 2009). Pathological gaming has been associated with poorer cognitive and emotional outcomes (Choo et al., 2010), but most of this research has focused on adolescents and emerging adults. Increasingly, adults are continuing to play video games throughout their lives and pathological gaming characteristics have the potential to interfere with parenting and romantic relationship outcomes. Yet, pathological gaming in adulthood, and its relation to parenting has been relatively ignored in the literature. The current study found that pathological gaming characteristics were related to decreased parental efficacy in mothers and fathers. It is vital that researchers continue to examine pathological gaming in adults and examine outcomes related to adulthood.

Declaration of Competing Interest

The authors' have no conflicts of interest to disclose.

Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.abrep.2019.100244>.

References

- Abidin, R. R. (1990). *Parenting Stress Index—Short form—test manual*. Charlottesville, VA: Pediatric Psychology Press.
- Ahlstrom, M., Lundberg, N., Zabriskie, R., Eggett, D., & Lindsay, G. (2012). Me, my spouse, and my avatar: The relationship between marital satisfaction and playing massively multiplayer online roleplaying games (MMORPGs). *Journal of Leisure Research*, 44, 1–22. <https://doi.org/10.1080/00222216.2012.11950252>.
- Anthony, L. G., Anthony, B. J., Glanville, D. N., Naiman, D. Q., Waanders, C., & Shaffer, S. (2005). The relationships between parenting stress, parenting behaviour, and preschoolers' social competence and behaviour problems in the classroom. *Infant and Child Development*, 14, 133–154. <https://doi.org/10.1002/icd.385>.
- Arbuckle, J. L., & Wothke, W. (1999). *Amos 4.0 user's guide*. Chicago: Small Waters.
- Ardelt, M., & Eccles, J. (2001). Effects of mothers' parental efficacy beliefs and promotive parenting strategies on inner-city youth. *Journal of Family Issues*, 22, 944–972. <https://doi.org/10.1177/019251301022008001>.
- Bacon, D. (2011). All the world's a game. *The Economist*. Retrieved from: <https://www.economist.com/special-report/2011/12/10/all-the-worlds-a-game>.
- Barnes, C. R., & Adamson-Macedo, E. N. (2007). Perceived maternal parenting self-efficacy (PMP S-E) tool: Development and validation with mothers of hospitalized pre-term neonates. *Journal of Advanced Nursing*, 60, 550–560. <https://doi.org/10.1111/j.1365-2648.2007.04445.x>.
- Berlin, K. S., Williams, N. A., & Parra, G. R. (2014). An introduction to latent variable mixture modeling (Part 1): Overview and cross-sectional latent class and latent profile analyses. *Journal of Pediatric Psychology*, 39, 174–187. <https://doi.org/10.1093/jpepsy/jst084>.
- Bornstein, M. H., Hendricks, C., Hahn, C., Haynes, O. M., Painter, K. M., & Tamis-LeMonda, C. S. (2003). Contributions to self-perceived competence, satisfaction, investment, and role balance in maternal parenting: A multivariate ecological analysis. *Parenting*, 3, 285–326. https://doi.org/10.1207/s15327922par0304_2.
- Brunborg, G. S., Mentzoni, R. A., & Frøyland, L. B. (2014). Is video gaming, or video game addiction, associated with depression, academic achievement, heavy episodic drinking, or conduct problems? *Journal of Behavioral Addiction*, 3, 27–32. <https://doi.org/10.1007/s11464-013-0304-2>.

- org/10.1556/JBA.3.2014.002.
- Bryanton, J., Gagnon, A. J., Hatem, M., & Johnston, C. (2008). Predictors of early parenting self-efficacy. *Nursing Research, 57*, 252–259. <https://doi.org/10.1097/01.nnr.0000313490.56788.cd>.
- Cheng, C., Cheung, M. W., & Wang, H. (2018). Multinational comparison of internet gaming disorder and psychosocial problems versus well-being: Meta-analysis of 20 countries. *Computers in Human Behavior, 88*, 153–167. <https://doi.org/10.1016/j.chb.2018.06.033>.
- Choo, H., Gentile, D. A., Sim, T., Khoo, A., & Liau, A. K. (2010). Pathological video-gaming among Singaporean youth. *Annals Academy of Medicine, 39*, 822–829. <https://doi.org/10.1542/peds.2010-1353>.
- Coleman, P. K., & Karraker, K. H. (2003). Maternal self-efficacy beliefs, competence in parenting, and toddlers' behavior and developmental status. *Infant Mental Health Journal, 24*, 126–148. <https://doi.org/10.1002/imhj.10048>.
- Copeland, D. B., & Harbaugh, B. L. (2004). Transition of maternal competency of married and single mothers in early parenthood. *The Journal of Perinatal Education, 13*, 3–9. <https://doi.org/10.1624/105812404X6171>.
- Coyne, S. M., Busby, D., Bushman, B. J., Gentile, D. A., Ridge, R., & Stockdale, L. (2012). Gaming in the game of love: Effects of video games on conflict in couples. *Family Relations, 61*, 388–396. <https://doi.org/10.1111/j.1741-3729.2012.00712.x>.
- Coyne, S. M., Dyer, W. J., Densley, R., Money, N. M., Day, R. D., & Harper, J. M. (2015). Physiological indicators of pathological video game use in adolescence. *Journal of Adolescent Health, 56*, 307–313. <https://doi.org/10.1016/j.jadohealth.2014.10.271>.
- Crawford, A. M., & Manassis, K. (2001). Familial predictors of treatment outcome in childhood anxiety disorders. *Child and Adolescent Psychiatry, 40*, 1182–1189. <https://doi.org/10.1097/00004583-200110000-00012>.
- Crnik, K. A., Gaze, C., & Hoffman, C. (2005). Cumulative parenting stress across the preschool period: Relations to maternal parenting and child behaviour at age 5. *Infant and Child Development, 14*, 117–132. <https://doi.org/10.1002/icd.384>.
- Cummings, E. M., Keller, P. S., & Davies, P. T. (2005). Towards a family process model of maternal and paternal depressive symptoms: Exploring multiple relations with child and family functioning. *Journal of Child Psychology and Psychiatry, 46*, 479–489. <https://doi.org/10.1111/j.1469-7610.2004.00368.x>.
- de Montigny, F. (2005). Perceived parental efficacy: A concept analysis. *Journal of Advanced Nursing, 49*, 387–396. <https://doi.org/10.1111/j.1365-2648.2004.03302.x>.
- Denis, A., Ponsin, M., & Callahan, S. (2012). The relationship between maternal self-esteem, maternal competence, infant temperament, and post-partum blues. *Journal of Reproductive and Infant Psychology, 30*, 388–397. <https://doi.org/10.1080/02646838.2012.718751>.
- Dong, G., Wu, L., Wang, Z., Wang, Y., Du, X., Potnza, M. N., & Haven, C. T. (2018). Diffusion-weighted MRI measures suggest increased white-matter integrity in internet gaming disorder: Evidence from the comparison with recreational internet gaming users. *Addictive Behaviors, 81*, 32–38. <https://doi.org/10.1016/j.addbeh.2018.01.030>.
- Fam, J. Y. (2018). Prevalence of internet gaming disorder in adolescents: A meta-analysis across three decades. *Scandinavian Journal of Psychology, 59*, 1245–1249. <https://doi.org/10.1111/sjop.12459>.
- Gentile, D. A. (2009). Pathological video-game use among youth ages 8 to 18. *Pediatrics, 123*, 595–785. <https://doi.org/10.1111/j.1469-9280.2009.02340.x>.
- Gentile, D. A., Choo, H., Liau, A., Sim, T., Li, D., Fung, D., & Khoo, A. (2011). Pathological video game use among youths: A two-year longitudinal study. *Pediatrics, 127*, 319–329. <https://doi.org/10.1542/peds.2010-1353>.
- Griffiths, M. D., Kuss, D. J., & King, D. L. (2012). Video game addiction: Past, present, and future. *Current Psychiatry Review, 8*, 1–11. <https://doi.org/10.2174/157340012803520414>.
- Grüsser, S. M., Thalemann, R., & Griffiths, M. D. (2007). Excessive computer game playing: Evidence for addiction and aggression? *CyberPsychology and Behavior, 10*, 290–292. <https://doi.org/10.1089/cpb.2006.9956>.
- Gunlicks, M. L., & Weissman, M. M. (2008). Change in child psychopathology with improvement in parental depression: A systematic review. *Child and Adolescent Psychiatry, 47*, 379–389. <https://doi.org/10.1097/CHI.0b013e3181640805>.
- Han, D. H., Hwang, J. W., & Renshaw, P. F. (2011). Bupropion sustained release treatment decreases craving for video games and cue-induced brain activity in patients with internet video game addiction. *Psychology of Popular Media Culture, 1*, 108–117. <https://doi.org/10.1037/2160-4134.1.S.108>.
- Han, D. H., Lee, Y. S., Yang, K. C., Kim, E. Y., Lyoo, I. K., & Renshaw, P. F. (2007). Dopamine genes and reward dependence in adolescents with excessive internet video game play. *Journal of Addiction Medicine, 1*, 133–138. <https://doi.org/10.1097/ADM.0b013e31811f465f>.
- Hanington, L., Ramuchandani, P., & Stein, A. (2010). Parental depression and child temperament: Assessing child to parent effects in a longitudinal population study. *Infant Behavior and Development, 33*, 88–95. <https://doi.org/10.1016/j.infbeh.2009.11.004>.
- Hess, C. R., Teti, D. M., & Hussey-Gardner, B. (2004). Self-efficacy and parenting of high-risk infants: The moderating role of parent knowledge of infant development. *Journal of Applied Developmental Psychology, 25*, 423–437. <https://doi.org/10.1016/j.appdev.2004.06.002>.
- Holgren, H. E. (2017). *For the love of a game: The effects of pathological video game use on romantic relationship satisfaction*. Master's thesis Brigham Young University, Provo: BYU Scholars Archive.
- Jackson, A. P. (2000). Maternal self-efficacy and children's influence on stress and parenting among single black mothers in poverty. *Journal of Family Issues, 21*, 3–16. <https://doi.org/10.1177/019251300021001001>.
- Jackson, A. P., & Huang, C. C. (2009). Parenting stress and behavior among single mothers of preschoolers: The mediating role of self-efficacy. *Journal of Social Service Research, 26*, 29–42. <https://doi.org/10.1080/01488370009511335>.
- Johns, J. (2006). Video games production networks: Value, capture, power relations and embeddedness. *Journal of Economic Geography, 6*, 152–180. <https://doi.org/10.1093/jeg/ibi001>.
- Jones, T. L., & Prinz, R. J. (2005). Potential roles of parental self-efficacy in parent and child adjustment: A review. *Clinical Psychology Review, 25*, 341–363. <https://doi.org/10.1016/j.cpr.2004.12.004>.
- Kline, R. B. (1991). Latent variable path analysis in clinical research: A beginner's tour guide. *Journal of Clinical Psychology, 47*, 471–484.
- Kohlhoff, J., & Barnett, B. (2013). Parenting self-efficacy: Links with maternal depression, infant behaviour and adult attachment. *Early Human Development, 89*, 249–256. <https://doi.org/10.1016/j.earlhumdev.2013.01.008>.
- Lampic, C., Svanberg, A. S., Karlström, P., & Tydén, T. (2006). Fertility awareness, intentions concerning childbearing, and attitudes towards parenthood among female and male academics. *Human Reproduction, 21*, 558–564. <https://doi.org/10.1093/humrep/dei367>.
- Leahy-Warren, P., McCarthy, G., & Corcoran, P. (2009). First-time mothers: Social support, maternal parental self-efficacy and postnatal depression. *Journal of Clinical Nursing, 1–10*. <https://doi.org/10.1111/j.1365-2702.2011.03701.x>.
- Lemmens, J. S., Valkenburg, P. M., & Gentile, D. A. (2015). The internet gaming disorder scale. *Psychological Assessment, 27*, 567–582. <https://doi.org/10.1037/pas0000062>.
- Liu, C., Chen, Y., Yeh, Y., & Hsieh, Y. (2011). Effects of maternal confidence and competence on maternal parenting stress in newborn care. *Journal of Advanced Nursing, 68*, 908–918. <https://doi.org/10.1111/j.1365-2648.2011.05796.x>.
- Levine, S. Z. (2013). Evaluating the seven-item Center for Epidemiological Studies on Depression Scale Short-form: A longitudinal U.S. community study. *Social Psychiatry, 48*, 1519–1526. <https://doi.org/10.1007/s00127-012-0650-2>.
- Lin, C. A. (1993). Exploring the role of VCR use in the emerging home entertainment culture. *Journalism Quarterly, 70*, 833–842. <https://doi.org/10.1177/107769909307000409>.
- Livingston, G. (2015, January). For most highly educated women, motherhood doesn't start until the 30s. Pew Research Center. Retrieved from <https://www.pewresearch.org/fact-tank/2015/01/15/for-most-highly-educated-women-motherhood-doesnt-start-until-the-30s/>.
- Lopez-Fernandez, O., Honrubia-Serrano, M. L., Baguley, T., & Griffiths, M. D. (2014). Pathological video game playing in Spanish and British adolescents: Towards the Internet Gaming Disorder symptomatology. *Computers in Human Behavior, 41*, 304–312.
- MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods, 4*, 84–99.
- Maxwell, S. E., Cole, D. A., & Mitchell, M. A. (2011). Bias in cross-sectional analyses of longitudinal mediation: Partial and complete mediation under an autoregressive model. *Multivariate Behavioral Research, 46*, 816–841. <https://doi.org/10.1080/00273171.2011.606716>.
- McDaniel, B. T., & Coyne, S. M. (2016). Technology interference in the parenting of young children: Implications for mothers' perceptions of coparenting. *The Social Science Journal, 53*, 435–443. <https://doi.org/10.1016/j.sosoci.2016.04.010>.
- McDaniel, B. T., & Radesky, J. S. (2018). Technoference: Parent distraction with technology and associations with child behavior problems. *Child Development, 89*, 100–109. <https://doi.org/10.1111/cdev.12822>.
- McMahon, C. A., Barnett, B., Kowalenko, N. M., & Tennant, C. C. (2006). Maternal attachment state of mind moderates the impact of postnatal depression on infant attachment. *Journal of Child Psychology and Psychiatry, 47*, 660–669. <https://doi.org/10.1111/j.1469-7610.2005.01547.x>.
- Mentzoni, R. A., Brunborg, G. S., Molde, H., Myrseth, H., Mår Skouvere, K. J., Hetland, J., & Pallesen, S. (2011). Problematic video game use: Estimated prevalence and associations with mental and physical health. *CyberPsychology, Behavior, and Social Networking, 14*, 591–596. <https://doi.org/10.1089/cyber.2010.0260>.
- Muthén, L. K., & Muthén, B. O. (2002). How to use a Monte Carlo study to decide on sample size and determine power. *Structural Equation Modeling, 9*, 599–620. https://doi.org/10.1207/S15328007SEM0904_8.
- Murray, L., & Cooper, P. J. (1997). Effects of postnatal depression on infant development. *Archives of Disease in Childhood, 77*. <https://doi.org/10.1136/adc.77.2.99>.
- Ngai, F., Wai-Chi, S. C., & Ip, W. (2010). Predictors and correlated of maternal role competence and satisfaction. *Nursing Research, 59*, 185–193. <https://doi.org/10.1097/NNR.0b013e3181dbb9ee>.
- O'Neil, J., Wilson, M. N., Shaw, D. S., & Dishion, T. J. (2009). The relationship between parental efficacy and depressive symptoms in a diverse sample of low income mothers. *Journal of Family Studies, 18*, 643–652. <https://doi.org/10.1007/s10826-009-9265-y>.
- Osmanovic, S., & Pecchioni, L. (2015). Beyond entertainment: Motivations and outcomes of video game playing by older adults and their younger family members. *Games and Culture, 11*, 130–149. <https://doi.org/10.1177/1555412015602819>.
- Paulus, F. W., Ohmann, S., von Gontard, A., & Popow, C. (2018). Internet gaming disorder in children and adolescents: A systematic review. *Developmental Medicine and Child Neurology, 60*, 645–659. <https://doi.org/10.1111/dmcn.13754>.
- Pedersen, F. A., Bryan, Y. E., Huffman, L., & Del Carmen, R. (1989). *Construction of self and offspring in the pregnancy and early infancy periods*. Paper presented at the Society for Research in Child Development, Kansas City, MO.
- Perrone, D., Sullivan, C. J., Pratt, T. C., & Margaryan (2004). Parental efficacy, self-control, and delinquency: A test of a general theory of crime on a nationally representative sample of youth. *International Journal of Offender Therapy and Comparative Criminology, 24*, 298–312. <https://doi.org/10.1177/0306624X03262513>.
- Porter, C. L., & Hsu, H. (2003). First-time mothers' perceptions of efficacy during the transition to motherhood: Links to infant temperament. *Journal of Family Psychology, 17*, 54–64. <https://doi.org/10.1037/0893-3200.17.1.54>.

- Radesky, J. S., Kistin, C. J., Zuckerman, B., Nitzberg, K., Gross, J., Kaplan-Sanoff, M., ... Silverstein, M. (2014). Patterns of mobile device use by caregivers and children during meals in fast food restaurants. *Pediatrics*, *133*, 843–849. <https://doi.org/10.1542/peds.2013-3703>.
- Rahman, A., Harrington, R., & Bunn, J. (2002). Can maternal depression increase infant risk of illness and growth impairment in developing countries? *Childcare, Health, and Development*, *28*, 51–56. <https://doi.org/10.1046/j.1365-2214.2002.00239.x>.
- Rodgers, A. Y. (1998). Multiple sources of stress and parenting behavior. *Child and Youth Services Review*, *20*, 525–546. [https://doi.org/10.1016/S0190-7409\(98\)00022-X](https://doi.org/10.1016/S0190-7409(98)00022-X).
- Sanders, M. R., & Woolley, M. L. (2004). The relationship between maternal self-efficacy and parenting practices: Implications for parent training. *Childcare, Health, and Development*, *31*, 65–73. <https://doi.org/10.1111/j.1365-2214.2005.00487.x>.
- Shumow, L., & Lomax, R. (2002). Parental efficacy: Predictor of parenting behavior and adolescent outcomes. *Parenting*, *2*, 127–150. https://doi.org/10.1207/s15327922par0202_03.
- Stockdale, L. A., Coyne, S. M., & Padilla-Walker, L. M. (2018). Parent and child technofluency and socioemotional behavioral outcomes: A nationally representative study of 10- to 20-year-old adolescents. *Computers in Human Behavior*, *88*, 219–226. <https://doi.org/10.1016/j.chb.2018.06.034>.
- Stone, L. (2018, February). American women are having fewer children than they'd like: Forecasts show many millennial women won't fulfill their wishes on family size, and the biggest fertility declines are in Western states. The New York Times. Retrieved from <https://www.nytimes.com/2018/02/13/upshot/american-fertility-is-falling-short-of-what-women-want.html>.
- Stratista (2011). Video game industry-statistics and facts. Retrieved from: <https://www.statista.com/topics/868/video-games/>.
- Tarkka, M. (2003). Predictors of maternal competence by first-time mothers when the child is 8 months old. *Journal of Advanced Nursing*, *41*, 233–240. <https://doi.org/10.1046/j.1365-2648.2003.02524.x>.
- Wang, R., Li, M., Zhao, M., Yu, D., Hu, Y., Wiers, C. E., ... Yuan, K. (2018). Internet gaming disorder: Deficits in functional and structural connectivity in the ventral tegmental area-accumbens pathway. *Brain Imaging and Behavior*. <https://doi.org/10.1007/s11682-018-9929-6>.
- Witteck, C. T., Finserås, T. R., Palsen, S., Mentzoni, R. A., Hanss, D., Griffiths, M. D., & Molde, H. (2015). Prevalence and predictors of video game addiction: A sample of study based on a national representative sample of gamers. *International Journal of Mental Health and Addiction*, *14*, 672–686. <https://doi.org/10.1007/s11469-015-9592-8>.
- WHO (2018). Gaming Disorder. Retrieved from: <http://www.who.int/features/qa/gaming-disorder/en/>.
- Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. *Educational Psychology Measures*, *76*, 913–934. <https://doi.org/10.1177/0013164413495237>.
- Wolfson, A., Lacks, P., & Futterman, A. (1992). Effects of parent training on infant sleep patterns, parents' stress, and perceived parental competence. *Journal of Consulting and Clinical Psychology*, *60*, 41–48. <https://doi.org/10.1037//0022-006x.60.1.41>.
- Zhao, X., Lynch, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research*, *37*, 197–206. <https://doi.org/10.1086/651257>.