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THREE MEASURES OF COPING IN VIDEO GAMES (CIV-III): THE DEVELOPMENT,  
CONSTRUCT VALIDATION, AND PROFILE ANALYSIS OF THE CIV-III

A defense submitted in partial fulfillment of the requirements for the degree of Doctor of  
Philosophy at Virginia Commonwealth University

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## **Abstract**

### **THREE MEASURES OF COPING IN VIDEO GAMES (CIV-III): THE DEVELOPMENT, CONSTRUCT VALIDATION, AND PROFILE ANALYSIS OF THE CIV-III**

Chelsea Marie Hughes, M.S.

A proposal submitted in partial fulfillment of the requirements for the degree of Doctor of  
Philosophy at Virginia Commonwealth University

Virginia Commonwealth University, 2015

Major Director: Everett L. Worthington, Jr., Ph.D.  
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Video games provide a competitive, goal-oriented environment. They involve individuals who often seek intentionally to frustrate their opponents' goals. The gaming community is made up of players who vary in their interpersonal style, learning histories, and skill levels. In this rich and dynamic environment, stress is a common experience. Given the prevalence of gameplay in the population and the frequency of gameplay among gamers, it is important to examine coping responses to stressors, particularly maladaptive ones. The present research entails three studies. In Study 1, I use exploratory factor analyses to develop three scales purported to measure maladaptive coping strategies in response to frustration in multiplayer video games: aggression (CIV-A), catharsis (CIV-C), and self-condemnation (CIV-S). In Study 2, I provide further evidence of the single factor structure identified in Study 1 using confirmatory factor analyses. I additionally provide evidence that the three CIV scales can be used as a single, three-factor measure (CIV-III). Moreover, I conduct a path analysis to provide initial evidence of the scale's

construct validity, wherein I provide evidence that measures of personality (anger and arousal) predisposition predict CIV-III subscale scores. Finally, in Study 3, I examine patterns of these coping styles by running a Latent Profile Analysis. I found evidence for four maladaptive coping profiles: low maladaptive coping, external maladaptive coping, internal maladaptive coping, and low maladaptive coping. Finally, I provide evidence that measures of personality and motivations for video gaming can predict coping profile membership.

## Four Measures of Coping in Video Games (CIV-IV): The Development, Construct Validation, and Profile Analysis of the CIV-IV

According to the Entertainment Software Association (ESA, 2015) in their annual publication on demographic and usage data in the video game industry, 155 million Americans play video games. Yet video game play is not just pervasive; it is frequent. Approximately 88% of gamers play three or more hours per week (ESA, 2015). Among adolescents, in some samples, rates as high as 97% have been found to play for at least one hour per day (Granic, Lobel, & Engels, 2014). Among college students, frequency of game play has been recorded up to 78 hours per week (Unsworth et al., 2015). With such a large population playing video games so frequently, it is important to examine the quality and content of that game time.

Gaming provides a competitive, goal-oriented environment that often involves teams who seek intentionally to frustrate their opponents' goals. A frequent emotion, then, is frustration, and often people respond in socially appropriate and socially destructive ways. Players differ in their personal responses to frustration, which is stressful. I conceptualize coping with frustration in video games within a stress-and-coping framework. In this dissertation, I review theories of ways that people deal with anger and frustration. In gaming situations, it is particularly important to be able to control maladaptive responding. For scientifically based guidance on how to control such responses, we must first measure and then later determine what might predict them.

Thus, I carry out research that consists of a pilot study and three studies. The pilot study solicits qualitative feedback from gamers about how they deal with frustration in video games. Those responses are used to inform item generation to create a quantitative measure of coping with game-based frustration. In my first study, I develop the coping scales, using exploratory

factor analysis. As I will describe in sections below, that measurement effort resulted in three independent scales. In my second study, I sought to provide evidence for construct validity in interpreting the scores on the scale. I thus examine the relationships among the three scales that I developed in Study 1, and provide evidence for their stability as a three-factor scale. In my third study, I used latent profile analysis to determine maladaptive coping profiles among gamers.

In these studies, I have several aims. First, I aim to contribute to our understanding of maladaptive coping in online gaming through examining its prevalence. I hope that this will be relevant for research and clinical uses. In research, I hope to understand what types of people are more likely to use each of the different coping mechanisms. Eventually, I aim to examine what influences coping style has within the context of actively played video games. In clinical work, I hope that this scale can be used to help clinicians understand the impact that video games have on their clients' lives and the lives of the clients' fellow gamers.

Second, I aim to show that coping responses do not occur in isolation. It is important to understand how these coping responses behave in relation to one another. This is particularly meaningful in the context of identifying detrimental coping patterns.

Third, I aim to identify social patterns. Frustration in one player often creates a feedback loop and influences other players' behaviors (Amsel, 1962). By examining these coping responses, I aim to map how one social exchange might instigate another social response. If I eventually find that certain coping responses are better-received by, or more beneficial to, the gaming community, I might be able to help players cope better, avoid social problems, and have more enjoyable games and lives.



Fourth, I aim to identify a larger variety of responses that people might find socially harmful to help people have a more nuanced view of how to avoid problems and have better experiences in games.

After describing the three studies, I provide a general discussion that ties theory together with the studies' findings. I then describe the limitations in the research, and speculate about a research agenda for the near future within the field of gaming, specifically using my research on coping with frustrating game experiences.

### **Review of the Literature**

In the present section, I provide a theoretical framework to study coping during stressful video games. I use theories involving aggression and stress-and-coping, and, when applicable, their involvement in the gaming literature.

#### **Responses to Stressful Gaming**

Due to the competitive and, for some, emotionally-charged nature of video games, gaming can be a stressful experience. Individuals are seeking to obstruct the goals of their opponents (and, sometimes, fellow teammates). This goal-obstruction invariably leads to *frustration*, which can be handled in a variety of ways – both adaptive and maladaptive. Through this review, I will define frustration and its place in the stress-and-coping framework (Lazarus, 1993) in the context of video game play. Furthermore, I will elaborate on various maladaptive methods of coping with that frustration and their present standing (or lack thereof) in psychological literature. Finally, I will introduce the purpose and rationale of the present studies.

**Frustration.** According to Dollard et al. (1939), frustration is “an interference with the occurrence of an instigated goal-response, at its proper time and behavior sequence” (p. 7). Frustration occurs when something does not happen in the way it was planned or it is not

executed as one intended. Dollard et al. (1939) specified that two conditions must be met for frustration to occur: (1) an organism must be expected to perform a certain act, and (2) the act must have been prevented from happening. Yet these goal-responses are not limited to a single event – instead, frustration can be an overarching theme, or a pattern of interference. For example, an individual may experience frustration through lack of a fulfilling career, or the absence of romance in his or her life.

Amsel (1992) described frustration from an operational-classical approach, in terms of *reward expectancies* and unconditioned stimuli. He proposed that frustration has four properties, occurring sequentially. The first is the primary frustration drive stimulus ( $S_F$ ), which is an unconditioned stimulus eliciting frustration. The second is unconditioned (primary) frustration ( $R_F$ ), which is an unconditioned reaction to  $S_F$ . The third and fourth factors are conditioned (anticipatory) frustration ( $r_F$ ) and its feedback stimulation ( $s_F$ ). These, Amsel argued, provide the foundation for the feedback system of frustration. As conditioned stimuli are repetitively paired with primary frustration, conditioned frustration ( $r_F$ ) to a conditioned stimulus ( $s_F$ ) is learned. The manifestation of that frustration then provides feedback to the organism, thereby influencing the organism's behavior thereafter. This feedback highlights the importance of how individuals cope with frustration. Based on learning generalization, frustration may then occur not just through the exposure of the unconditioned stimulus, but at the mere stimulation of its unconscious learned memory. Just as Little Albert came to fear all little white rodents (Watson & Rayner, 1920), gamers may begin to feel frustration at the proximally-frustrating behavior of others.

***Frustration and video games.*** As anyone with experience playing or spectating video games can attest, video games can be a source of frustration. Individuals may be frustrated with

themselves (e.g., lacking ability), other individuals (e.g., unwillingness to cooperate), and even the gaming system itself (e.g., technical dysfunction<sup>1</sup>). These may occur in both competitive and non-competitive gameplay. Consistent with previous research done on frustration, frustration in gaming has been found to be related to state hostility (Anderson & Dill, 2000). However, playing violent video games more frequently has been associated with decreased feelings of hostility after experiencing in-game frustration (Whitaker, Melzer, Steffgen, & Bushman, 2013).

We can apply these theories and concepts to a gaming experience. Imagine that two teammates, Diane and Leo, are playing a video game together for the first time. Diane tells her teammate to return to home-base to buy more equipment; however, Leo does not comply within five seconds or so. At the most basic level, Leo did not listen to Diane's command (unconditioned stimulus), which interferes with her goal-response, which leads to frustration (unconditioned response). Imagine that this occurs on several occasions, and Diane comes to associate Leo's delay (conditioned stimulus) with non-compliance. In the future, Diane becomes frustrated not only when Leo does not comply, but simply when he hesitates, or does not comply quickly enough (in her judgement). Diane's frustration, however, is not the end of the exchange. Diane will have some consequential reaction to the frustration she is experiencing (Dollard et al., 1939; Lazarus, 1993; Miller, 1941).

***Coping with frustration.*** According to Lazarus (1993), coping is the process of altering one's circumstances or their interpretation to make them appear more favorable to us. Coping

---

1. This concept of computer-based frustration introduces a minor contradiction in Dollard et al.'s (1939) definition of frustration, in which the source of frustration must be an organism. Computer-based technologies have development dramatically since the 1930s; though computers are not truly autonomous, they possess enough independent functioning to produce "interference with the occurrence of an instigated goal-response" (p. 7). Though this investigation will focus on socially initiated frustration, I suggest that possible sources of frustration include any stimulus with any operations independent of the instigator.

can be a behavior, like utilizing deep breathing to reduce anxiety, or a process, consisting of ongoing efforts in action and thought to manage a situation. Coping is preceded by cognitive appraisal, or an individual's assessment of the stressor. Appraisal mediates the relationship between a stressor (i.e., any demand to change) and perceived stress. Different appraisals can explain why a single stressor can affect two individuals so differently (Lazarus, 1999). For example, getting a C on a test might be assessed as catastrophic for a high-achieving student, leading to higher perceived stress. Yet that same passing grade might be assessed positively by a low-achieving student, leading to a lower stress response or even calm satisfaction.

Following appraisal and a stress reaction, coping is generally categorized into two subgroups: problem-focused or emotion-focused coping. *Problem-focused coping* is characterized by coping aimed to change one's circumstances – to alter the problem causing the stress. *Emotion-focused coping*, on the other hand, is characterized by coping aimed to change one's emotional response to the stressor (Lazarus, 1993). Park and Folkman (1997) have also identified meaning-focused coping. *Meaning-focused coping* is an attempt to alter the appraised meaning of the situation to be more consistent with one's personal beliefs and goals. In the context of frustration in gaming, we find various types of coping, some more palatable than others.

### **Two Active Responses to Frustration: Aggression and Catharsis**

**Aggression.** One of the possible methods of coping with frustration in gaming is aggression (Ferguson & Rueda, 2010). Dollard et al. (1939) defined *aggression* as a “sequence of behavior, the goal-response to which is the injury of the person toward whom it is directed” (p. 9). More recently, aggression has been defined as “any behavior intended to harm another person who does not want to be harmed” (Dewall, Anderson, & Bushman, 2011, p. 449). This

definition covers three critical factors of aggression. First, aggression must be a behavior; it is not merely a thought, feeling, or intention. Second, aggression must be an action intended to harm another individual: for example, a therapist might ask a client to recall painful memories, but the intention is to help, not harm, the client. Third, aggression must be enacted against an individual who does not wish to be harmed. As Dewart, Anderson, and Bushman (2011) point out, some individuals derive sexual pleasure from being physically abused. These individuals are not victims of aggression, because they desire the “harmful” experience.

***Components of aggression.*** Aggression has a long history in psychological literature. It has been examined typically through its form and function: how aggression manifests and what purpose it serves (e.g., Dewart, Anderson, & Bushman, 2011; Gentile, Mathieson, & Crick, 2011). According to Buss and Perry (1992), aggression takes four forms: “physical and verbal aggression, which involve hurting and harming others...Anger, which involves the physiological arousal and preparation for aggression...[and] hostility, which consists of feelings of ill will and injustice.” (p. 457). Together, these make up the instrumental, physiological, and emotional components of aggression.

***Functions of aggression.*** Aggression serves several purposes. For example, it might be used to relieve tension and feelings of hostility and anger towards something. It might be used to assert one’s dominance in a social situation. At its most basic level, aggression’s function has been factored into two categories, both relating to aggression’s incitation: proactive and reactive. *Proactive* aggression, as defined by Raine and colleagues (2006), is an organized, instrumental, and un-elicited (“cold-blooded”) act of aggression. Examples of proactive aggression, retrieved from the Reactive-Proactive Questionnaire (RPQ; Raine et al., 2006), include fighting for social status, making prank phone calls for fun, and yelling at others to manipulate their behavior. They

define *reactive aggression*, on the other hand, as fear-induced, laden with irritability and hostile affect, and utilized as a defensive response to provocation. It involves reduced self-control and heightened impulsivity (Atkins, Stuff, Osborne, & Brown, 1993; Raine et al., 1998). Examples of reactive aggression, also retrieved from the RPQ, include getting angry when frustrated, yelling when annoyed, and getting mad when losing a game (Raine et al., 2006).

**Aggression and video games.** Since the 1980s, behavioral researchers have studied the positive relationship between video game use and aggression (Cooper & Mackie, 1986; Dominick, 1984). To date, there have been hundreds of correlational and experimental studies examining that relationship (Breuer, Vogelgesang, Quandt, & Festl, 2015). These have incited both scholars and the public to question whether or not video games, specifically violent ones, are hazardous for impressionable youth (Ferguson, Olson, Kutner, & Warner, 2014). Despite the immense body of literature, there is still an ongoing debate about the nature of the association. There are three key points of contention in this debate. First, the bulk of the evidence suggests a correlational, not causal relationship. Even the evidence suggesting a correlation varies considerably between studies (Breuer, Vogelgesang, Quandt, & Festl, 2015). Second, most of the studies suggesting a causal link have notable errors in measurement and generalizability: for example, using measures of aggression that have not been properly validated, or examining only short-term effects of exposure (Breuer, Vogelgesang, Quandt, & Festl, 2015). Finally, the associations and effects that have been observed are comparable to those found in a variety of other media outlets, including children's cartoons. In a meta-analysis of 32 independent studies, Sherry (2001) found that the strength of the association between video game violence and aggression (Cohen's  $d = .30$ ) was less than half of that found between television violence and aggression (e.g., Cohen's  $d = .65$ ; Paik & Comstock, 1994). Interestingly, Sherry (2001, 2007)

also found that the effect size was negatively related to participants' amount of playing time, when controlling for their age and the year the study took place. The results indicate that "playing even the most violent of games for extended times may not increase aggression," (p. 425). In fact, individuals who play violent video games more frequently (than players who historically prefer non-violent games) report lesser feelings of hostility and depression after experiencing frustration in a video game (Whitaker, Melzer, Steffgen, & Bushman, 2013).

This debate has pervaded mass media, academia, and even the United States government. In 2011, the Supreme Court case *Brown v. Entertainment Merchants Association* brought to question whether the state of California could enact restrictions on the sale of violent video games to minors. The court ruled in favor of the Entertainment Merchants Association (EMA), citing as its primary point the EMA's First Amendment right to freedom of speech. Though the First Amendment took the front seat of the court's justification, Justice Scalia highlighted the aforementioned scientific evidence behind the ruling, which strongly aligns with the points of contention identified by Breuer, Vogelgesang, Quandt, and Festl (2015):

California relies primarily on the research of Dr. Craig Anderson and a few other research psychologists whose studies purport to show a connection between exposure to violent video games and harmful effects on children. These studies have been rejected by every court to consider them, and with good reason: They do not prove that violent video games cause minors to act aggressively... Instead, "[n]early all of the research is based on correlation, not evidence of causation, and most of the studies suffer from significant, admitted flaws in methodology"... Even taking for granted Dr. Anderson's conclusions that violent video games produce some effect on children's feelings of aggression, those effects are both small and indistinguishable from effects produced by other media. In his testimony in a similar lawsuit, Dr. Anderson admitted that the "effect sizes" of children's exposure to violent video games are "about the same" as that produced by their exposure to violence on television... the same effects have been found when children watch cartoons starring Bugs Bunny or the Road Runner, or when they play video games... that are rated "E" (appropriate for all ages)... or even when they "vie[w] a picture of a gun." (*Brown v. Entertainment Merchants Association*, 2011).

The positive association between violent video games and aggression is well-documented. The dispute lies in the nature of that relationship. Longitudinal research has focused on two complementary hypotheses: the socialization hypothesis and the selection hypothesis. The socialization hypothesis states that repeated use of violent media increases aggression over time through social learning. This hypothesis has been supported and also not supported on various occasions (e.g., Anderson & Dill, 2000; Breuer, Vogelgesang, Quandt, & Festl, 2015; Krahé & Möller, 2008; Sherry, 2001). The selection hypothesis suggests that characteristically more aggressive players will choose to play aggressive games. Therefore, some variance in aggressive behavior might be better accounted for by trait aggression in addition to the effect of violence exposure. This hypothesis has found considerable support in the literature over the last decade (e.g., Anderson et al., 2004; Breuer, Vogelgesang, Quandt, & Festl, 2015; Gentile, Lynch, Linder, & Walsh, 2004; Sherry, 2001).

***Within-game aggression.*** However, aggression in video games plays a much greater role than simply being the result of violence-exposure and selectivity of people into choosing to play such games. As many scholars have noted, the online gaming environment is a massive platform for social interaction (Granic, Lobel, & Engels, 2014; Hughes, 2017). Some of that social interaction can be aggressive. Aggression can occur within the game itself. That aggression (a) provides a legitimate game-based response, (b) creates stress responses (and possibly reactive aggression) within its players, and (c) creates a competitive, sometimes hostile environment. In fact, empirical evidence suggests that the online gaming world is an especially hostile, or “toxic,” environment (Fox & Tang, 2013; Kuznekoff & Rose, 2013). Operationally, that translates to players using controversial language, trash-talking, and making belligerent comments, particularly targeted towards those viewed as “outsiders” (Fox & Tang, 2013; Gray,



2012; Wright, Boria, & Breidenbach, 2002). Research has also identified an aggressive gaming behavior commonly referred to as *trolling*, characterized by items like, “I have intentionally performed poorly in a game,” and “I enjoy making the game suck for my teammates” (Hughes, 2017). Looking at the literature, it seems that individuals are simply more likely to act anti-socially in the online gaming environment than in face-to-face interaction. Hughes (2017) suggests two complementary theories that might contribute to this inflation of anti-social behavior.

***De-individuation-anonymity theory and the rise of anti-social gaming behavior.*** The first, de-individuation-anonymity theory (Reicher, 1984), suggests that being in a group reduces an individual’s sense of identity, resulting in reduced self-regulation and reduced self-awareness. Research has demonstrated that computer-mediated interaction provides many of the same conditions found in de-individuation-anonymity (Joinson, 1999; Kiesler, Siegel, & McGuire, 1984). Lea and Spears (1991) proposed that computers affect our behavior similarly to being in a large group. For example, Joinson (1999) collected data on self-reported measures of social desirability, self-consciousness, and self-esteem. The  $n = 82$  undergraduate participants filled out these measures either anonymously (online) or identifiably (using pen and paper, writing their name on the response sheet). Results demonstrated that the participants in the anonymous condition reported lower self-consciousness and social desirability, and higher self-esteem, than those in the non-anonymous condition. These findings suggest that, when we are anonymous, we might be more willing to express ourselves in socially unacceptable ways than we would through face-to-face interaction. Given the inherent anonymity of massive multiplayer online gaming, similar disinhibition might occur in social interaction in online gaming.

***Moral disengagement theory and the rise of anti-social gaming behavior.*** The second theory, moral disengagement theory, takes de-individuation-anonymity one step closer towards explaining the prevalence of aggression and anti-social behavior online. Moral disengagement theory, introduced by Bandura in 1999, suggests that when people are in a position to dehumanize another person, they are more likely to enact less moral (or more immoral) behaviors than when people are more humanized. The same effect occurs when people are able to depersonalize their own actions. The dehumanization of fellow gamers and the depersonalization of behavior are inherent components of the online gaming experience, especially in massively online play. Rather than individuals being acknowledged as people playing the game, they can be easily perceived as just avatars, or just in-game-names. The experience can be viewed as “just a game,” which might also lead a person to depersonalize his or her own behavior and its effects on other game figures or game players. Therefore, the online gaming environment might influence its players to “disengage” from societal norms of behavior and their own moral standards, resulting in more aggressive and anti-social behavior than they might engage in during non-game interactions. This is especially meaningful when individuals are in a competitive, goal-oriented, and frustration-inducing environment.

***Frustration-aggression theory and its spinoffs.*** According to Dollard et al. (1939), aggression is always a consequence of frustration. This is the foundation of *frustration-aggression theory*. Miller (1941) objected to the absoluteness of this theory, suggesting that frustration can lead to various possible responses, including the desire to escape and to maneuver around the obstacle causing the frustration. He posited that individuals will choose the method that best reduces frustration; therefore, aggression will only occur if it has been learned as an effective tool in the given situation or is the only (or best) response available. Berkowitz (1989)

added that aggression also will be the likely choice if an aggressive cue is given. The consistency in these theories is that aggression can occur as a consequence of frustration, which has been supported empirically. In 1991, Novaco, Kliever, and Broquet found that when people's desire to arrive at their destination on-time is hindered, they are more likely to act aggressively. Unemployment, which is a frustration of financial goals, is associated with higher levels of aggression (Catalano, Novaco, & McConnell, 2002).

***Frustration-aggression in gaming.*** More recently, a study of gamers ( $N = 76$ ) found that losing a video game can increase postgame aggression (Breuer, Scharkow, & Quandt, 2015). In gaming, frustration has been found to be associated with state hostility (Anderson & Dill, 2000). Given the prevalence of aggressive behavior in online games (e.g., Dietz, 1998; Fox & Tang, 2014), some theories would suggest that the aggressive climate fosters further aggressive behavior. For example, cultivation theory (Gerbner, Gross, Morgan, & Signorielli, 1986) might suggest that the toxic environment will not only provide aggressive cues to its frustrated players, thereby increasing aggression (Berkowitz, 1989), but will also teach those players that aggression is an acceptable and effective tool in team-based play, thereby increasing aggression (Miller, 1941).

***Reasons frustration can lead to aggression in gaming.*** Recently, Breuer, Scharkow, and Quandt (2015) argued that “frustration plays a major role in the relationship between video game use and aggression for two reasons,” (p. 8). First, frustration possessed the strongest effect ( $d = 1.43, p < .001$ ) on negative affect, and also was most strongly correlated with measures of state aggression. Second, frustration itself is the mediating variable between a win-loss scenario and negative affect, which in turn amplifies aggressive behavioral tendencies.

However, as Miller (1941) and Berkowitz (1989) noted, aggression is not the only possible response to frustration. Given the computer-mediated interaction that dominates online communication and the social undesirability of aggressive behavior, direct aggression against those who frustrate a player is not always an option.

**Catharsis.** Catharsis comes from the Greek word *katharsis*, meaning a purging or a cleansing. In psychological terms, catharsis theory states that acting aggressively is an effective way to rid oneself of aggressive feelings (Bushman, 2002). This could translate to direct aggression enacted against the source of those feelings, or displaced aggression enacted toward a separate individual or object. Catharsis theory first gained popularity in the late 1800s by well-known theorist Sigmund Freud and his colleague Josef Breuer (Breuer, Freud, & Strachey, 1991). They believed that anger operated like a hydraulic system: anger creates pressure in the body, which causes undesirable psychological symptoms (like nervous outbursts, the trademark of hysteria). Freud believed that neurotic individuals were more prone to catharsis than others (Breuer, Freud, & Strachey, 1991), which has since found scientific support (David & Suls, 1999; Gunthert, Cohen, & Armeli, 1999). Catharsis theory suggests that through “aggressive” actions, even those towards inanimate objects, one might release the pressure and thus alleviate their symptoms (Breuer, Freud, & Strachey, 1991).

***The historical rise and fall of catharsis theory.*** Shortly after Freud’s *Studies on Hysteria*’s release in 1955 (Breuer, Freud, & Strachey, 1991), catharsis theory came across some resistance. In one of the first tests of the theory, Hornberger (1959) had participants receive an insult from a confederate. Following the insult, half the participants hammered nails for 10 minutes, while the other half did nothing. Afterwards, participants were given the chance to criticize the confederate that insulted them. According to catharsis theory, those who purged

their feelings through hammering would demonstrate less aggression than those who sat and bottled up their feelings. However, the results told a different story: those who hammered the nails were more hostile towards the person when compared to those who did nothing.

Criticisms of catharsis theory hit their peak in the 1970s, when Albert Bandura (1973) released a paper calling for a moratorium on catharsis theory and the use of venting in therapy. This was not to suggest that individuals do not utilize catharsis; instead, Bandura argued that it was an ineffective coping strategy at reducing anger and should not be encouraged in therapy aimed at reducing anger or aggression. Shortly thereafter, “The catharsis of aggression: An evaluation of a hypothesis,” was published by Geen and Quanty (1977). They concluded that cathartic venting did not reduce aggression -- if anything, it increased aggressive behavior. These findings have been supported in more recent studies (e.g., Bushman, Baumeister, & Stack, 1999). Geen and Quanty (1977) did concede, however, that physiological arousal could be reduced by venting anger, but only in very specific circumstances. They found that individuals must express their anger directly to the person who angered them, without fear of retaliation. Furthermore, venting indirectly against a substitute target (i.e., displaced aggression) was not effective in reducing arousal.

***Catharsis and video games.*** No studies have found any support for cathartic effects of aggression in video games. However, catharsis beliefs do play a role in gaming. In 2010, Bushman and Whitaker studied the effects of cathartic beliefs in undergraduates ( $n = 120$ ). In an experimental manipulation, participants were prompted via random assignment to read a fictitious newspaper article supporting catharsis, refuting catharsis, or unrelated to catharsis, then rated how believable they found the article. After, they were randomly assigned to an anger-inducing or nonangered condition. Finally, participants completed an interest survey that

included descriptions of eight fictitious video games (four violent, and four nonviolent). Results found a significant interaction between the article type and whether or not they were angered. Angered participants primed with procatharsis wanted to play violent video games more than other participants did. Furthermore, angered participants who read the control or anticatharsis articles wanted to play the violent video games less than the other participants did. In a cross-sectional study, Ferguson, Olson, Kutner, and Warner (2010) asked middle school students ( $N = 1,254$ ) about their catharsis-seeking motivations to play video games (e.g., “to help me relax” or “to get my anger out”). Results indicated that participants who used video games for cathartic motivations were more likely to play violent video games than those who did not. These findings suggest that gamers who believe in the cathartic effect of aggressive gaming might be more likely to play violent video games.

### **Two Passive Responses to Frustration: Avoidance and Self-Condensation**

The two coping strategies discussed thus far, aggression and catharsis, entail the most represented maladaptive coping strategies in the gaming literature. However, this list is not comprehensive. When gamers get frustrated, there are other options besides aggression enacted towards people and objects. As Miller (1941) pointed out, people may opt to maneuver around the stressor.

**Avoidance coping.** Avoidance coping is a disengagement coping strategy characterized by minimizing, denying, or avoiding stress (Holahan, Moos, Holahan, Brennan, & Schutte, 2005). It can be considered problem-focused (i.e., removing oneself from a stressful situation), emotion-focused (i.e., eliminating the negative emotional experience by removing exposure to the stressor), or meaning-focused (i.e., denial that a stressor is impactful or hurtful to oneself). An overwhelming amount of research has identified avoidance coping as largely maladaptive for

recurring or persistent stressors. It is strongly associated with negative health outcomes (for review, see Penley, Tomaka, & Wiebe, 2002). Research suggests that avoidance coping is generally ineffective at the long-term reduction of stress, because it never actually addresses the threat's existence or impact (Carver & Connor-Smith, 2010). Moreover, avoidance coping can actually lead to a paradoxical increase in stress, as it can increase intrusive thoughts about the stressor, and thus can cause an increase in anxiety and negative mood (Najmi & Wegner, 2008).

***Avoidance coping and video games.*** Avoidance coping in gaming literature has received considerable attention, though not with relation to coping with stressful gaming experiences. Gaming itself has been identified as a method of avoidance coping, from avoiding pain in medical settings (Wohlheiter & Dahlquist, 2012) to avoiding depression and suicidal ideation (Kim, Han, Trksak, & Lee, 2014). Empirical studies assessing avoidance strategies for coping with unpleasant gaming experiences are non-existent, save for one. A recent article by Cote (2015) examined methods of coping employed by female gamers to deal with harassment experienced in online gaming. Through grounded theory and intensive interviews, Cote identified avoidance as a predominant coping tactic. Interestingly, based on the non-directive approach of grounded theory, even this study did not approach the topic with the explicit intent of studying avoidance coping.

Among victims of cyberbullying, which has demonstrated similarities to aggressive gaming behavior (Hughes, 2017), avoidant coping has been associated with depressive coping (Vollink, Bolman, Dehue, & Jacobs, 2013). Evidence suggests that avoidance is ineffective at reducing bullying behavior in the long-term (Mahady Wilton, Craig, & Pepler, 2000). Certain games have implemented features to facilitate avoidance coping in social gaming. For example, the massively online game *League of Legends* (developed by Riot Games) allows players to mute

each other. This serves to remove the stressor (verbal harassment) from the player-victim's gaming experience. Yet the muting function only addresses the stressor in the moment. The feature does not remove verbal harassment itself, and therefore does not effectively reduce the behavior from the bully's social repertoire.

Aside from being a largely ineffective coping strategy for recurring stressors, avoidance coping has been linked to other maladaptive forms of coping, like acquiescence and self-condemnation (Mahady Wilton, Craig, & Pepler, 2000).

**Self-condemnation.** Self-condemnation, also referred to as *self-blame*, is a meaning-focused coping strategy. It is characterized by attributing a stressful situation to oneself, including one's personality or behavior. Self-condemnation coping has typically been examined in the context of trauma, such as sexual assault (e.g., Ullman, Peter-Hagene, & Relyea, 2014), bereavement (e.g., Stroebe et al., 2014), and post-traumatic stress disorder (e.g., Ullman & Peter-Hagene, 2014). Individuals who are characteristically high in self-blame are more likely to have lower self-esteem and higher levels of shame, and overall higher psychological distress (Graven et al., 2014; Kaur & Kaur, 2015). A recent study by Schacter and Juvonen (2015) posited that self-condemnation can be both characterological (e.g., "getting bullied is my fault and there's nothing I can do") and behavioral (e.g., "I should have been more careful"). The study demonstrated that adolescent victims of bullying ( $N = 5,991$ ) are more likely to engage in characterological self-blaming in schools where bullying is uncommon. Conversely, victims are more likely to engage in behavioral self-blaming in schools where bullying is more common.

***Self-condemnation and video games.*** Currently, no existing studies examine self-condemnation coping in the context of frustration in video games. In the setting of bullying and peer aggression, self-condemnation has been linked to the internalization of problems, which has



been linked to non-utilization of social supports (Perren, Ettekal, & Ladd, 2013; Tenenbaum, Varjas, Meyers, & Parris, 2011). Based on the performance- and goal-oriented nature of video games, as well as the bullying behavior that can follow performance-related failure, it is likely that self-blame is a coping strategy utilized in video games. Moreover, the results from Schacter and Juvonen (2015) suggest that, in an online environment where bullying and toxicity is commonplace, gamers might be especially likely to utilize behavioral self-blame.

### **Application of Four Coping Responses in Gaming**

To examine these concepts in the context of frustration during gaming, let us return to the example of our gamers, Diane and Leo. We have determined that the experience of frustration will cause some reaction (i.e., a stress reaction) in Diane. She will need to cope with that frustration.

If Diane is characteristically a passive and agreeable person, she might alter her appraisal of Leo's non-compliance, telling herself, *It's really not a big deal that Leo didn't listen to me*. She might also cope with her negative emotions about the situation. For example, she might take some deep breaths to reduce her feelings of anger. In any case, sitting quietly without retaliating will likely diminish her negative feelings (Bushman, 2002).

A more problem-focused, dominant Diane might try to communicate to Leo why she gave that specific command. Or she might teach Leo about the game, correct the problem, and thereby avoid its future occurrence. These reactions would be considered problem-focused and socially constructive coping. All of these would entail adaptive coping responses: she reduced her negative feelings, and she is able to continue playing the game with her friend.

On the other hand, Diane may have learned previously that scolding her teammates will elicit the desired behavior from them. Thus she might yell at Leo, making him feel badly,

asserting her own dominance, but ultimately changing Leo's behavior. This form of coping would be considered both aggressive and problem-focused, with intention of (1) harming Leo, and (2) removing the source of Diane's frustration.

If Diane is a more impulsive and expressive person, but still non-aggressive, she might groan loudly, slam her fist against the table, or throw her computer mouse against the wall. This would constitute cathartic behavior. According to many theorists, this would not actually reduce her hostile feelings, though it might provide temporary relief from her physiological arousal (Berkowitz, 1964; Bushman, 2002; Mallick & McCandless, 1966).

Yet Diane might instead utilize an avoidance strategy: she might be unable to tolerate Leo's disobedience, and therefore decide to stop playing with Leo. While her negative feelings will likely have been reduced, she would no longer be able to continue playing the game with her friend.

If Diane had been characterologically prone to self-blame and had little self-compassion, she might cope by excessively blaming herself. She might condemn herself as an ineffective leader or an unskilled player.

All of these coping responses – aggression, catharsis, avoidance, and self-condemnation – can be identified as maladaptive. They do not meet both criteria for adaptive responding: they do not reduce negative feelings, and they do not allow Diane to continue playing with her friend.

These coping responses often constitute the social environment of gaming. Someone does something that a player does not like, and he or she reacts to it. Frustration will undoubtedly occur. Games are competitive, with the aim of achieving goals and denying opponents mutually exclusive goals. Players' performance will be inconsistent, and people have free will. Interference with goal-responses (intentional and unintentional) is inevitable. Yet it is how

people handle their frustration – how they cope - that toxifies or detoxifies the gaming experiences and the experiences of those around them.

### **Summary of the Review**

In summary, gaming provides a competitive, goal-oriented environment. It involves teams who seek intentionally to frustrate their opponents' goals. It consists of players of different personalities, moods, learning and reinforcement histories, interpersonal sensitivities, skill levels, and responsiveness to social cues like depersonalization or moral disengagement. Players also differ in emotional regulation, frustration tolerance, willpower, habit strength, self-control, ego-depletion, and coping repertoires. In addition, teams and opponents' teams vary and create an ever-changing social and competitive environment that can turn toxic or nurturing almost instantly.

In this rich and frequently changing environment, stress is commonplace and reactions can be volatile. Both adaptive and maladaptive coping responses are frequent. However, Baumeister et al. (2001) have noted that "bad is stronger than good," (p. 323). That is, it takes over five positive adaptive responses often to neutralize the negative impact of one maladaptive, aggressive response. Thus in gaming situations, it is particularly important to be able to control maladaptive responding. For scientifically based guidance on how to control such responses, we must first measure and then later determine what might predict them.

### **Present Studies**

#### **Description of the Studies**

The present dissertation includes three studies and a pilot study. The pilot study solicited qualitative feedback from gamers about their responses to frustration in video games, which informed item generation. The first study is a scale development study, entailing item generation

and factor analysis of four independent scales. The second study is aimed to provide evidence for construct validity and examine the relationships among the four scales developed in Study 1. The third study utilizes latent profile analysis to determine maladaptive coping profiles among gamers.

### **Purposes of the Studies**

These studies are purported to serve several purposes. First, I aim to contribute to our understanding of maladaptive coping in online gaming through examining its prevalence. This will hopefully serve both research and clinical functions. In research, I might hope to understand what types of individuals are more likely to utilize different coping mechanisms. Eventually, I aim to examine what influences coping style in the context of video games. In clinical work, I hope that this scale can be utilized to help clinicians understand the impact that video games have on their clients' lives and the lives of the clients' fellow gamers. As I have previously mentioned, interaction in online gaming is notoriously toxic (Fox & Tang, 2014). Therefore, it is crucial that we examine how individuals respond to that toxicity.

Second, these studies address that coping responses do not occur in isolation. It is important to understand which coping responses are utilized, but it is more valuable to understand how these coping responses behave in relation to one another. This is particularly meaningful in the context of identifying detrimental coping patterns. For example, avoidance coping itself is not necessarily harmful to the player or gaming community. However, avoidance when paired with self-condemnation could be harmful to the player.

Third, frustration responses create a feedback loop and influence behavior (Amsel, 1962). By examining these coping responses, we are not only looking at the result of one social exchange, but also at the instigation of another social response. If we eventually come to find

that certain coping responses are better-received by, or more beneficial to, the gaming community, we might find reason to influence players to cope in one way over another.

Fourth, current literature places a disproportionate weight on aggressive reactions to frustration in video games. Yet the negative physical, mental, and social consequences of frustration are not limited to intentional interpersonal harm (i.e., aggression). As previously discussed, reactions like self-condemnation are negatively impactful, as well (Graven et al., 2014; Kaur & Kaur, 2015). Aggression is merely one piece of the maladaptive puzzle. In highly competitive and intensely social environment of online games, greater attention must be paid to a more inclusive range of unhealthy coping behaviors.

### **Pilot Study: Review of Available Assessment Instruments and Qualitative Survey**

Prior to the development of the Coping in Videogames (CIV) scale, I first needed accomplish two goals: first, to determine the need for such a scale; and second, to collect qualitative information to inform item generation. The pilot study of this dissertation includes a review of available assessment instruments ( $N = 254$  measures) and a qualitative survey ( $N = 8$ ) assessing participants' responses to frustration in video games.

### **Review of Available Assessment Instruments**

In the following review of relevant literature, I review the questionnaires, inventories, measures and scales that examine behavior, attitudes, and content related to gaming. On 17 October 2015, I ran the term “games” through the *PsyscTESTS* database utilizing the overall search function. I chose this broad term based on the inconsistent terminology around video gaming (e.g., “videogames,” “video games,” or “online gaming.”) Thus, any test with the word “games” in its title, construct, or abstract was retrieved. I identified  $N= 254$  individual tests. I removed  $n=108$  tests from the review because they were unrelated to video games (for example,

they involved gambling or children's play toys). I also eliminated an additional 39 tests from the review because they were proximally related to video games (for example, they contained a single item asking about video games in a greater study of children's sedentary behaviors). One test that was not identified in *PsycTESTS* was added; this was the measure developed in my unpublished master's thesis. Thus 108 tests were included the review of all tests and measures related to video games.

**Results of the review: Types of scales available.** Results of this review suggest that a scale assessing individual's behaviors in and reacting to online games has not yet been developed. The largest portion of the tests ( $n = 17$ ; 15.7%) assessed video game addiction and problematic gaming, which have the potential to address coping behaviors. Examination of the items in these scales revealed a strong focus on the frequency of game-play, interference with daily life, and the utilization of games as a form of coping. For example, in the Video Game Risk Factors Measure, children are asked to indicate their level of agreement with the item, "When I'm playing on the computer, problems and worries become unimportant" (Rehbein & Baier, 2013). These measures appear to be targeting clinically-oriented symptomology (as one might find in the diagnostic criteria of the DSM-5) and problematic gaming, associated with a troubled home-life.

**Common constructs that measures purportedly assess.** Another common construct in the measures was the players feelings of connectedness with his or her avatar, the gaming community, or the game environment itself ( $n = 11$ ; 10.2%). The next most frequent construct assessed gamers' motivations for playing video games ( $n = 10$ ; 9.3%), followed closely by evaluative assessments (e.g., ease of use, desire to play;  $n = 9$ ; 8.3%), measures of attitudes towards gaming ( $n = 8$ ; 7.4%), tests that were specific to a particular game ( $n = 8$ ; 7.41%), and

multifaceted measures (e.g., assessing both addiction and motivation;  $n = 8$ , 8.3%). The remaining test constructs ( $n = 45$ ; 41.7%) individually constituted less than 6% of the overall tests. A table including all test constructs can be found in Appendix A.

**What is missing?** The results of the review suggest that questions specifically targeting methods of coping with unpleasant gaming experiences have yet to be developed. A recent study by Hughes (2017) developed a scale that measures two factors of social behavior in online gaming: constructive and destructive social behavior. This study most closely approximates the idea of maladaptive responses to frustration in online gaming, because it includes aggressive responding (e.g., “I get verbally aggressive with other players). However, with the destructive subscale only consisting of three items and only encompassing social behavior, the experience of feeling stressed and frustrated within a game is still left empirically unearthed. This gap in the literature represents an important component of the gaming experience: coping with the inevitable frustration that arises in video games.

### **Qualitative Survey**

To inform item generation for the scale,  $N = 8$  participants anonymously completed a qualitative survey. An anonymous, qualitative survey format was chosen for two reasons: first, identifiable methods of qualitative feedback (i.e., focus groups) likely would have compromised the validity of participant responses due to the social desirability bias associated with these maladaptive coping strategies; and second, an open-ended, qualitative format allowed for a broad examination of coping responses. The survey consisted of twelve questions that assessed responses to frustration caused by other players when playing video games. Participants were asked to answer “each question as fully and completely as you can.” Questions were both open-ended (e.g., “What kinds of things do you do when you feel this way?”) and prompted (e.g.,

“Think about when you’re playing with other people, as opposed to playing alone. Are there any differences in the way you act? If so, what’s different? What’s the same?”). Questions assessed for both behaviors and psychological experiences (i.e., thoughts and feelings).

**Common themes.** Participant responses were examined by the researcher to determine common themes in maladaptive coping responses. These common themes, or “dimensions,” would constitute the behaviors captured by the scales in development. To be included as a dimension, two criteria must have been met: (1) it must have been provided by at least one participant; and (2) it must, through theoretical justification, be unsuccessful in reducing frustration (see Review of the Literature). Through examining participant responses, four dimensions arose: aggression (“I may behave rudely towards them”), catharsis (“[I] smash buttons harder than necessary, on rare occasions throw my mouse/controller”), avoidance (“I just walk away,”), and self-condemnation (“Usually something self-deprecating since I’m annoyed with myself,”). These four dimensions constituted the constructs of the scales in development.

**Item generation.** For each scale, between 18 and 20 items were generated. Whenever possible, the specific language used by the participants in the qualitative survey was preserved (e.g., the interchangeable use of “mouse” and “controller”). Items were generated collaboratively with content experts, including psychologists with specializations in aggression, self-condemnation, coping, and psychometrics. On each scale, participants are asked, “How well do these responses describe your behavior when you have gotten FRUSTRATED by another player while playing video games?” Participants may respond on a 4-point response format, ranging from 1 = *Not well at all; this is very unlike me to do* to 4 = *Very well; this is very much like me to do*. Examples of the items included, “got verbally aggressive with other players” (aggression, 18 items), “took it out on the things around me” (catharsis, 18 items), “avoided the person who



frustrated me” (avoidance, 18 items), and “blamed myself” (self-condemnation, 20 items). The resulting four measures were used for the split-sample exploratory factor analyses in Study 1.

### **Study 1**

In Study 1, I computed four Exploratory Factor Analyses (EFA) on the four measures that were created in the pilot study. Furthermore, I computed correlations on the winnowed measure and various measures of personality and behavior to inform the selection of construct validity measures that will be employed in Study 2. Thus, for Study 1 my aims are to arrive at a simple structure for the four scales, and to identify appropriate constructs for providing subsequent construct validity evidence for interpreting scores on the instruments.

### **Method**

**Participants.** Participants in Study 1 were recruited through two major media during the spring of 2016. To be considered for this study, participants must have (1) been at least 18 years of age, (2) played video games within the past six months that allow for communication between players, and (3) experienced frustration caused by another player while playing video games in the past six months. As a method check, participants were asked, “Over the past 6 months, have you gotten frustrated by another player while playing video games?” Participants must have responded “Yes” to proceed with the survey. Of the 254 consented participants, 5 participant records were eliminated due to substantial numbers of incomplete responses (>25%); an additional 10 participant records were eliminated due to failure to accurately respond to three of the five validation questions (i.e., please answer “D”). Undergraduate students from Virginia Commonwealth University were recruited through their introduction to psychology classes ( $n = 175$ ). Participants were also recruited through campus and social media outreach, including

university clubs and through online forums ( $n = 39$ ). The remaining  $n = 25$  participants did not disclose their method of recruitment.

Based on the exploratory factor analysis practices outlined by Costello and Osborne (2005), we determined that a participant-to-item (per measure) ratio of approximately 5:1 would be sufficient for data collection. With the 18-20 items on each CIV measure, our split-samples of  $n = 119$  and  $n = 120$  participants were sufficient for the split-sample exploratory factor analysis (EFA). Participants for Study 1 included a sample of adult volunteers. Of the participants,  $n = 144$  (61%) identified as male;  $n = 85$  (36%), as female; and the remaining  $n = 10$  (3%), as transgender or other. Participant ages ranged from 18 to 48 ( $M = 20.94$ ,  $SD = 4.13$ ). Of the participants,  $n = 98$  (41%) identified as Non-Hispanic White or Euro-American;  $n = 48$  (20%) as Black or African American,  $n = 29$  (12%) as East Asian or Asian American,  $n = 15$  (6%) as Multi-ethnic,  $n = 11$  (5%) as South Asian or Indian American, and the remaining (16%), as a variety of other races or ethnicities. Based on the considerations outlined by Landers and Behrend (2015), for the use of convenience sampling and its threat to external validity, we determined that the target population of online gamers could be adequately captured through mixed online and university-based convenience sampling.

**Measures.** I included the four scales in development, demographic information, and measures providing initial evidence for construct validity (to determine their likelihood for inclusion in Study 2).

***Coping In Video Games – Aggression (CIV-A).*** Participants were provided with the prompt, “When I’m playing video games and someone FRUSTRATES me (prevents me from achieving my goal)...”, and they were asked to respond to items assessing likelihood of aggressive coping responses. The initial scale consisted of 18 items. Participants responded using

a 4-point response format, ranging from 1 = *very uncharacteristic of me* to 4 = *very characteristic of me*. A typical item on the CIV-A is, “said offensive things to others.”

***Coping In Video Games – Catharsis (CIV-C)***. Participants were provided with the prompt, “When I’m playing video games and someone FRUSTRATES me (prevents me from achieving my goal)...”, and they were asked to respond to items assessing likelihood of cathartic coping responses. The initial scale consisted of 18 items. Participants responded using a 4-point response format, ranging from 1 = *very uncharacteristic of me* to 4 = *very characteristic of me*. A typical item on the CIV-C is, “slammed my hand against the table.”

***Coping In Video Games – Avoidance (CIV-Av)***. Participants were provided with the prompt, “When I’m playing video games and someone FRUSTRATES me (prevents me from achieving my goal)...”, and they were asked to respond to items assessing avoidant coping responses. The initial scale consisted of 18 items. Participants responded using a 4-point response format, ranging from 1 = *very uncharacteristic of me* to 4 = *very characteristic of me*. A typical item on the CIV-Av is, “tried to end the game as quickly as possible.”

***Coping In Video Games – Self-Condensation (CIV-S)***. Participants were provided with the prompt, “When I’m playing video games and someone FRUSTRATES me (prevents me from achieving my goal)...”, and they were asked to respond to items assessing self-condemning coping responses. The initial scale consisted of 20 items. Participants responded using a 4-point response format, ranging from 1 = *very uncharacteristic of me* to 4 = *very characteristic of me*. A typical item on the CIV-S is, “I usually feel like I’m at fault.”

***Busy-Perry Aggression Questionnaire (AQ) – Verbal Aggression & Anger*** (Buss & Perry, 1992). The AQ is a widely-utilized four-factor measure of aggression with 29 items. For the purpose of this study, I only used the Verbal Aggression (5 items) and Anger (7 items)

subscales. Participants were asked to rate a series of statements, ranging from 1 = *extremely uncharacteristic of me*, to 7 = *extremely characteristic of me*. Examples of items on the Verbal Aggression and Anger subscales are, “When people annoy me, I tell them what I think of them,” (verbal aggression) and “I flare up quickly but get over it quickly,” (anger). Alphas for the Verbal Aggression and Anger subscales were reported to be .72 and .83, respectively (Buss & Perry, 1992). The subscale scores have been found to have estimated temporal stability over a 9-week interval of .76 (verbal aggression) and .72 (anger). The AQ has strong evidence supporting the construct validity of verbal aggression and anger. It has been correlated with similar constructs within the Big-Five personality, alcohol outcomes, peer nominations, the Novaco Anger Scale (NAS; Novaco, 1994), and the like. In the present study, Cronbach’s alpha for the Verbal Aggression subscale was .80 and for the Anger subscale, was .75.

***Emotional Reactivity (ERS)*** (Docherty et al., 2009). The ERS consists of 13 items purported to assess emotional reactivity. Participants can respond using a response format ranging from 0 = *never* to 4 = *always, or almost always*. Factor analysis revealed that a single factor best describes participant response patterns. In a control sample, Cronbach’s alpha for the scale was .83. Item-to-scale correlations were all positive, ranging from  $r = .26 - .75$ . Examples from items on the scale include, “I am easily upset,” and “I have big ups and downs in mood.” The scale has showed strong evidence supporting convergent and divergent validity through correlations with temperament and behavioral activation and inhibition. Criterion validity has been demonstrated predicting specific types of psychopathology and measures of self-injury. In the present study, Cronbach’s alpha for the ERS was .85.

***Self-Compassion (SCS)*** (Neff, 2003). The SCS consists of 26 items across six factors purported to assess self-compassion: self-kindness, self-judgment, common humanity, isolation,

mindfulness, and over-identification. Participants can respond using a 5-point response format, ranging from 1 = *almost never* to 5 = *almost always*. Factor loadings on all of the subscales ranged from .57 to .80. Example items from the measure include, “I’m kind to myself when I’m experiencing suffering” (self-kindness), “I’m intolerant and impatient towards those aspects of my personality I don’t like” (self-judgment), and “I try to see my failings as a part of the human condition” (common humanity). The scores have estimated temporal stability over 3 weeks from .80 to .93. Alphas for the subscales ranged from .75 to .81. The SCS has been found to have evidence supporting its construct validity using measures of self-criticism and social connectedness, and good evidence supporting its criterion validity of various mental health outcomes, like depression and anxiety. In the present study, the Cronbach’s alphas for the SCS subscales were as follows: Self-kindness (.89), Self-judgment (.87), Common humanity (.87), Isolation (.85), Mindfulness (.85), and over-identification (.86).

***Sociality in Multiplayer Online Games (SMOG)*** (Hughes, 2017). The SMOG is a two-factor measure of social behavior in online gaming, and it consists of 6 items, 3 items from each subscale: Constructive (SMOG-C) and Destructive (SMOG-D) social behavior during games. Participants can rate the frequency with which they enact certain social behaviors using an 8-point response format, ranging from 0 = *never* to 7 = *always*. Examples from the measure include, “I get verbally aggressive with other players,” (SMOG-D) and “I encourage my teammates during gameplay” (SMOG-C). Alphas for the SMOG-D and SMOG-C range from .70-.75, and .72-.79, respectively. The subscales have demonstrated evidence for initial construct validity using Big-Five personality traits and interpersonal measures of dominance and affiliation. In the present study, Cronbach’s alpha for the SMOG-D was .74 and alpha for SMOG-C was .88.

***Interpersonal Adjective Scale Revised Big-5 (IASR-B5) – Dominance & Neuroticism***

***Subscales*** (Trapnell & Wiggins, 1990). The IASR-B5 is a 124-item scale that measures the Big 5 personality traits (Neuroticism, Extroversion/Surgency, Openness to experience, Conscientiousness, and Agreeableness), and two markers of the interpersonal circumplex coordinates of dominance and nurturance (comparable to Kiesler's, 1982, interpersonal circle). In the case of this present study, I will be using only the Neuroticism and Dominance subscales, totaling 32 items. The IASR-B5 provided alphas ranging from .87 to .94 (Trapnell & Wiggins, 1990), and acceptable convergent properties when compared to the NEO-Personality Inventory (also a measure of the Big 5 personality traits). Participants are asked to rate the degree to which they believe an adjective describes themselves (e.g., dominant). Responses are recorded on an 8-point rating ranging from 0 = *extremely inaccurate* to 7 = *extremely accurate*. Alpha coefficients range from .77 to .88 (Trapnell & Wiggins, 1990). In the present study, Cronbach's alpha for the Dominance subscale was .88, and Cronbach's alpha for the Neuroticism subscale was .87.

***Coping Strategy Indicator (CSI)*** (Amirkhan, 1990). The CSI consists of a total of 33 items, broken down into three factors: problem-solving (PS), seeking support (SS), and avoidance (A). Participants can respond using a 3-point response format, ranging from 1 = *not at all*, 2 = *a little*, and 3 = *a lot*. Examples from the scale include, "tried to solve the problem" (problem-solving, PS), "sought reassurance from those who know you best" (seeking support, SS), and "avoided being with people in general" (avoidance, A). Cronbach's alpha for the subscales are .89 (PS), .93 (SS), and .84 (A); and the scale demonstrated evidence for good estimated test-retest reliability, from .77-.86 over four to eight weeks. The overall scale has demonstrated evidence of good construct validity by correlations with various measures of depression and personality. Instrumental coping (i.e., PS and SS) has been found to be positively

associated with decreased symptomology, while avoidance has been found to be positively associated with increased symptomology. In the present study, Cronbach's alpha for the CSI was .87.

**Procedure.** Based on the advantages, limitations, and considerations of online data collection outlined by Granello and Wheaton (2004), as well as our technologically-oriented target population of gamers, I determined that online data collection would be appropriate. Data were collected and managed using REDCap (Research Electronic Data Capture) tools hosted through Virginia Commonwealth University (Harris et al., 2009). REDCap is a secure, web-based application designed to support data capture for research studies. Participants could participate in the online survey anywhere they had an internet connection. Upon accessing the survey, participants gave informed consent, and they were debriefed upon completing the survey.

## **Results**

To determine the structure of the scales in development, four split-sample exploratory factor analyses (EFA) were conducted on the four measures developed in the pilot study. Participant responses were randomly assigned to each split-sample. To be included in the final measure of Study 1, the items must have been retained across both split-samples. Additionally, following the EFAs, inter-item correlations were run to help reduce redundancy in the measures. Finally, correlations of the CIV scale scores and various measures of behavior and personality were examined to inform the assessment of construct validity in Study 2. Data were cleaned using IBM Statistics SPSS – Version 23 (IBM Corp., 2015). The data were checked for lack of normality, linearity, and homoscedasticity of the residuals through examination of basic statistics and histograms. Due to the statistically sensitive nature of scale development, responses were

Windsorized (i.e., all responses in which  $SD > 3.29$  or  $SD < -3.29$  will be replaced with  $SD = \pm 3.29$ ).

**CIV-Aggression (CIV-A).** A split-sample EFA was conducted on the CIV-A measure across two groups. In Subsample A, I ran an EFA with Principal Axis Factoring and a Varimax rotation on the 18 items. According to Cattell and Jaspers (1967), the preliminary factor retention can be determined by an initial scree plot. The scree plot strongly suggested a single-factor structure (Eigenvalue = 6.75). To be retained, the item must have maintained a primary factor loading of .50. I eliminated 5 items that did not meet the inclusion criterion. I computed an EFA with no rotation (due to the single factor structure) on the remaining 13 items, all of which met inclusion criteria.

In Subsample B, I ran an EFA with Principal Axis Factoring and a Varimax rotation on the 18 items. The scree plot also strongly suggested a single-factor structure (Eigenvalue = 8.57). The item retention criterion was the same from Subsample A (primary factor loading  $\geq .50$ ). I eliminated 4 items that did not meet the inclusion criterion. I again computed a follow-up EFA, this time with no rotation due to the single factor structure, on the remaining 14 items, all of which met the inclusion criterion.

I compared the retained items from Subsample A (13 items) and Subsample B (14 items). There were 13 common items retained after both EFAs (see Appendix B). Thus, the winnowed CIV-A measure from Study 1 contained 13 items on a single factor. The retained 13 items and their inter-item correlations were examined to further winnow the items. I removed 4 items due to high inter-item correlations and linguistic similarity with other items. Therefore, the final CIV-A measure from Study 1 contained 9 items on a single factor.



Scores on the 9 items from the CIV-A were summed to create a total CIV-A scale score. I then computed correlations between this score and scores on various measures of behavior and personality to inform the construct validation measures for Study 2. CIV-A scores were positively correlated with verbal aggression ( $r = .378, p < .001$ ), anger ( $r = .425, p < .001$ ), destructive gaming behavior ( $r = .552, p < .001$ ), dominance ( $r = .193, p < .001$ ) and over-identification ( $r = .135, p < .05$ ).

**CIV-Catharsis (CIV-C).** A split-sample EFA was conducted on the CIV-C measure across the same two subsamples as with CIV-Aggression. In Subsample A, I ran an EFA with Principal Axis Factoring and Varimax rotation on the 18 items. The scree plot strongly suggested a single-factor structure (Eigenvalue = 6.88). I eliminated 5 items that did not meet the inclusion criterion (primary factor loading  $\geq .50$ ). I computed an EFA with no rotation on the remaining 13 items, all of which met the inclusion criterion.

In Subsample B, I ran an EFA with Principal Axis Factoring on the 18 items. The scree plot again strongly suggested a single-factor structure (Eigenvalue = 8.26). I eliminated 4 items that did not meet the inclusion criterion (primary factor loading  $\geq .60$ ). I again computed an EFA with no rotation on the remaining 14 items, all of which met the inclusion criterion.

I compared the retained items from Subsample A (13 items) and Subsample B (14 items). There were 13 common items retained after both EFAs (see Appendix **B**). Thus, the winnowed CIV-C measure from Study 1 contained 13 items on a single factor. The retained 13 items and their inter-item correlations were examined to further winnow the items. I removed 4 items due to high inter-item correlations and linguistic similarity with other items. Therefore, the final CIV-C measure from Study 1 contained 9 items on a single factor.

The scores on the 9 items from the CIV-C were summed to create a total CIV-C scale score. I then computed correlations with this score and various measures of behavior and personality to inform the construct validation measures for Study 2. CIV-C scores were positively correlated with scores on avoidance coping ( $r = .199, p < .001$ ), verbal aggression ( $r = .237, p < .001$ ), anger ( $r = .408, p < .001$ ), destructive gaming behavior ( $r = .349, p < .001$ ), self-judgment ( $r = .294, p < .001$ ), isolation ( $r = .145, p < .05$ ), over-identification ( $r = .298, p < .001$ ), neuroticism ( $r = .261, p < .001$ ), and emotional reactivity ( $r = .242, p < .001$ ). CIV-C scores were negatively correlated with self-kindness ( $r = -.186, p < .001$ ) and mindfulness ( $r = -.143, p < .05$ ).

**CIV-Avoidance (CIV-Av).** A split-sample EFA was conducted on the CIV-Av measure across two subsamples. In Subsample A, I computed an EFA with Principal Axis Factoring and Varimax rotation on the 18 items. The scree plot strongly suggested a single-factor structure (Eigenvalue = 5.26). I eliminated 9 items that did not meet the inclusion criterion (primary factor loading  $\geq .50$ ). I computed an EFA with no rotation on the remaining 9 items, all of which met the inclusion criterion.

In Subsample B, I computed an EFA with Principal Axis Factoring and Varimax rotation on the 18 items. The scree plot strongly suggested a single-factor structure (Eigenvalue = 5.14). I eliminated 10 items that did not meet the inclusion criterion (primary factor loading  $\geq .50$ ). I computed an EFA with no rotation on the remaining 8 items; 2 items were eliminated due to failure to meet the inclusion criterion. I computed a final EFA with no rotation on the remaining 6 items, all of which met the inclusion criterion.

I compared the retained items from Subsample A (9 items) and Subsample B (6 items). There were 3 common items that were retained after both EFAs. Due to the structural instability

of the CIV-Av which would have a maximum of three items (and might lose other items in subsequent analyses), this measure was dropped from the project at this time.

**CIV-Self-Condensation (CIV-S).** A split-sample EFA was conducted on the CIV-S measure across two subsamples. In Subsample A, I computed an EFA with Principal Axis Factoring and Varimax rotation on the 20 items. The scree plot strongly suggested a single-factor structure (Eigenvalue = 9.34). I eliminated two items that did not meet the inclusion criterion (primary factor loading  $\geq .50$ ). I computed an EFA without rotation on the remaining 18 items, all of which met the inclusion criterion.

In Subsample B, I ran an EFA with Principal Axis Factoring and Varimax rotation on the 20 items. The scree plot strongly suggested a single-factor structure (Eigenvalue = 9.37). I eliminated two items that did not meet the inclusion criterion (primary factor loading  $\geq .50$ ). I again computed an EFA without rotation on the remaining 18 items, all of which met the inclusion criterion.

I compared the retained items from Subsample A (18 items) and Subsample B (18 items). There were 18 common items retained by both EFAs (see Appendix B). Thus, the winnowed CIV-S measure from Study 1 contained 18 items on a single factor. The retained 18 items and their inter-item correlations were examined to further winnow the measure. I removed 9 items due to high inter-item correlations and linguistic similarity with other items. Therefore, the final CIV-S measure from Study 1 contained 9 items on a single factor.

Scores on the 9 items from the CIV-S were summed to create a total CIV-S scale score. I then computed correlations between this score and scores on various measures of behavior and personality to inform the construct validation measures for Study 2. CIV-S scores were positively correlated with avoidance coping ( $r = .261, p < .001$ ), verbal aggression ( $r = .215, p <$

.001), anger ( $r = .288, p < .001$ ), destructive gaming behavior ( $r = .248, p < .001$ ), self-judgment ( $r = .242, p < .001$ ), common humanity ( $r = .163, p < .05$ ) isolation ( $r = .168, p < .05$ ), over-identification ( $r = .289, p < .001$ ), neuroticism ( $r = .266, p < .001$ ), and emotional reactivity ( $r = .265, p < .001$ ).

Among the three CIV measures, CIV-A was positively correlated with both CIV-C ( $r = .552, p < .001$ ) and CIV-S ( $r = .341, p < .001$ ). CIV-C was positively correlated with CIV-S ( $r = .432, p < .001$ ). These findings suggest that all three maladaptive coping strategies covered in this study – aggression, catharsis, and self-condemnation – are positively associated with one another. This also suggests that there is perhaps a secondary factor that might justify the use of the CIV scales not only individually, but perhaps also as subscales of a higher-order factor.

## **Discussion of Study 1**

In Study 1, I developed three measures that examine maladaptive (harmful) coping strategies used by gamers when they experience frustration caused by another player: namely, aggression (CIV-A), catharsis (CIV-C), and self-condemnation (CIV-S). Each of the measures contained 9 items and a single-factor structure. Although an avoidance coping strategy was identified in the pilot study (consistent with the findings of Cote, 2015), it was subsequently removed from the project due to the instability of its structure as determined by split-sample EFAs. This decision was further supported by its theoretical incongruence with the other three measures. While aggression, catharsis, and self-condemnation are active and harmful coping strategies, which require the inclusion of a new behavior, avoidance coping is a passive strategy, which requires the termination of a behavior, and can be used as a healthier alternative to aggression. Moreover, discontinuing gameplay that is distressful may not be regarded widely as an unhealthy coping strategy.

The CIV-A items included both active and passive forms of aggression. The behaviors identified in the CIV-A strongly resembled the destructive social gaming behaviors identified by Hughes (2017). In both cases, gaming aggression was characterized by three primary behaviors: verbal aggression, trolling (intentionally performing poorly), and toxicity (creating an unpleasant environment for other players). The CIV-C items included both verbal (i.e., “yelled at the game itself”) and physical (i.e., “threw things”) behavioral catharsis. However, cathartic aggression aimed towards other people (which still constitutes catharsis; Bushman, 2002) was not included in this scale, as it was captured by the CIV-A. Finally, the CIV-S items included components of cognitive rumination (“kept thinking how I wish I acted differently”) and emotional distress (“got upset with myself”). It also included both the characterological (“felt like a failure”) and behavioral (“questioned why I acted the way I did”) components of self-condemnation. These findings are consistent with Schacter and Juvonen’s (2015) characterization of self-condemnation.

All three CIV scales shared moderate to high correlations ( $r = .341-.552$ ) I also found positive correlations between the CIV measures and other measures of personality and behavior. The CIV-A was correlated positively with aggression (i.e., verbal aggression, anger, and gaming aggression) and dominance. Both the CIV-C and CIV-S were positively correlated with avoidance coping, aggression, neuroticism, and negatively with various components of self-compassion. These findings provide initial evidence of construct validity which will be examined further in Study 2. Interestingly, all three CIV measures were correlated positively with over-identification, a characteristic conceptually opposed to self-compassion. Over-identification also pertains to the stress-and-coping model (Lazarus, 1993), specifically meaning-focused coping (Park & Folkman, 1997), wherein an individual appraises a situation as being excessively

meaningful to oneself. These findings might suggest that these maladaptive coping strategies in video games are mechanized by appraisal in the stress-and-coping model. However, further examination would be needed to support such a claim.

## **Study 2**

In Study 2, I conducted three separate Confirmatory Factor Analyses (CFAs) on the three CIV measures to provide further evidence supporting their structure (and content validity) and to finalize the items. I also conducted a single CFA on the three measures combined to determine their applicability as a three-factor measure of maladaptive coping in video games. To provide further evidence regarding the construct validity of the CIV scales, I conducted a path analysis using two measures of personality associated with stress and coping: anger and arousal predisposition.

### **Anticipated Theoretical Associations**

In the present section, I describe the theoretical background which justifies my hypotheses for Study 2, specifically relating to trait anger and arousal predisposition.

**Anger.** According to Buss and Perry (1992), anger is the physiological arousal associated with aggression. It is recognized as both a state emotion and a trait characteristic (Spielberger & Sydeman, 1983). It is commonly accompanied by feelings of hostility and ill will (Buss & Perry, 2002). In the stress-and-coping model, anger is generally conceptualized as a negative emotion, typically brought on by the harm, loss, and threat appraisals (Folkman, 1984). The expression of anger (i.e., aggression) allows someone to cope with their stress through temporary feelings of relief. For example, a person may verbally accost someone after a perceived slight to restore their feelings of self- or social-esteem (Lazarus, 2000). Aside from the positive feelings associated with restored esteem, catharsis theory would suggest that a person would experience

relief merely through the expression of their anger (Breuer, Freud, & Strachey, 1991; Bushman, 2002).

**Arousal predisposition.** According to Coren and Mah (1992), arousal predisposition, also known as arousability, refers to an individual's responsiveness to variations in environmental conditions. It is considered not only to be a trait, but a central component to many aspects of personality (Eysenck, 1967, 1970, 1981). Related to stress-and-coping, high levels of arousability has been associated with more endorsement of stress-related symptoms (Hicks, Conti, & Nellis, 1992). Research has also found that arousal predisposition is a positive and significant predictor of anti-social and delinquent behavior (Coren, 1999).

## **Hypotheses**

There were several hypotheses for Study 2. First, I hypothesized that all CIV scales (CIV-A, CIV-C, and CIV-S) would be inter-correlated positively (Hypothesis 1). In other words, I hypothesized that the CIV-III factors would be non-orthogonal.

In the path model, I hypothesized that anger would be a positive predictor for responses on the CIV-A (Hypothesis 2). This hypothesis is supported by the work of Buss and Perry (1992), who have identified anger as the cognitive component of aggression. I also hypothesized that anger would be a positive predictor of responses the CIV-C (Hypothesis 3). This hypothesis is supported by the modern definition of catharsis (Bushman, 2002), wherein it is used to rid oneself of aggressive thoughts (i.e., anger) and feelings. I hypothesized a nonsignificant relationship between anger and the CIV-S (Hypotheses 4). Because the items of the Anger subscale of the BPAQ (Buss & Perry, 1996) conceptualize anger as an outward behavior, I hypothesized that the inward nature of self-condemnation would not be captured by the anger

items. On the other hand, research on self-forgiveness and anger does show some small negative relationship (Davis, Ho, Griffin, Bell, Hook, Van Tongeren, ... Westbrook, 2015).

Next, I hypothesized that arousal predisposition would be a negative predictor of scores on the CIV-A (Hypothesis 5). Research has demonstrated that anti-social and aggressive behaviors tend to be committed by individuals with low arousal profiles (Coren, 1999; Woods & White, 2005). I also hypothesized that arousal predisposition would be a positive predictor of both CIV-C scores (Hypothesis 6) and CIV-S (Hypothesis 7) scores. Research has demonstrated that arousal predisposition affects both an individual's affectual experience and physiological experience (Coren & Mah, 1993). Moreover, arousal predisposition also has ruminative characteristics, wherein the individual's response to a stimulus endures well after the situation that elicited the response (Coren & Mah, 1993). The CIV-C captures indicators of physiological arousal, and the CIV-S captures indicators of rumination; and therefore I hypothesized positive predictive relationships.

Finally, I hypothesized three interaction effects. As suggested by the literature, individuals with low arousal profiles are more likely to commit anti-social behaviors (Coren, 1999; Woods & White, 2005); and some have suggested that high arousability might protect individuals from committing anti-social acts (Raine, Venables, & Williams, 1993). Therefore, I hypothesized that high levels of arousal predisposition would dampen or nullify the positive relationship between anger and aggressive coping (CIV-A scores; Hypothesis 8). I hypothesized that high levels of arousal predisposition would amplify the positive relationship between anger and cathartic coping (CIV-C scores; Hypothesis 9). Finally, I hypothesized a nonsignificant interaction effect of arousal predisposition on hypothesized nonsignificant relationship between anger and self-condemnation (CIV-S scores; Hypothesis 10).



## Method

**Participants.** To determine the number of participants required for the study, I computed an *a priori* power analysis using G\*Power 3.1.9.2. Using the most conservative effect sizes found in the literature between my target personality traits and maladaptive coping strategies ( $r = .11-.14$ ; Coren, 1999), I estimated a conservative effect size (.12) with an acceptable power level of .80. Results indicated that a sample size of 127 would be sufficient. My sample size of  $N = 135$  participants exceeded that requirement.

To be considered for this study, participants must have (1) been at least 18 years of age, (2) played video games within the past six months that allow for communication between players, and (3) experienced frustration caused by another player while playing video games in the past six months. As a method check, participants were asked, “Over the past 6 months, have you gotten frustrated by another player while playing video games?” Participants must have responded “Yes” to proceed with the survey.

Of the 147 consented participants, 4 participant records were eliminated due to substantial numbers of incomplete responses ( $>25\%$ ), and an additional 8 participant records were eliminated due to failure to accurately respond to three of the five validation questions (i.e., please answer “D”). Undergraduate students from Virginia Commonwealth University were recruited through their introduction to psychology classes ( $n = 100$ ). Participants were also recruited through campus and social media outreach, including university clubs and through online forums ( $n = 23$ ). The remaining  $n = 12$  participants did not disclose their method of recruitment.

Of the participants,  $n = 166$  (49%) identified as male;  $n = 61$  (45%), as female; and the remaining  $n = 8$  (6%), as transgender or other. Participant ages ranged from 18 to 50 ( $M = 20.87$ ,

$SD = 4.34$ ). Of the participants,  $n = 70$  (52%) identified as Non-Hispanic White or Euro-American;  $n = 16$  (12%) as Black or African American,  $n = 12$  (9%) as East Asian or Asian American,  $n = 10$  (7%) as South Asian or Indian American, and the remaining (20%), as a variety of other races or ethnicities. Based on the considerations outlined by Landers and Behrend (2015), for the use of convenience sampling and its threat to external validity, we determined that the target population of online gamers could be adequately captured through mixed online and university-based convenience sampling.

**Measures.** Measures for this study included demographic information and the three CIV scales developed in Study 1. We summarized below the forms of the CIV used in the present study. Two measures of personality are also described below.

**CIV-A.** The CIV-A is purported to assess aggressive coping responses to frustration in video games. It contains the 9 items that were retained from Study 1. Participants were provided with the prompt, “When I’m playing video games and someone FRUSTRATES me (prevents me from achieving my goal)...”, and they were asked to respond to items assessing likelihood of aggressive coping responses. Participants responded using a 4-point response format, ranging from 1 = *very uncharacteristic of me* to 4 = *very characteristic of me*. A typical item on the CIV-A is, “got verbally aggressive with other players.” In the present study, the Cronbach’s alpha for the 9-item CIV-A was .90.

**CIV-C.** The CIV-C is purported to assess cathartic coping responses to frustration in video games. It contains the 9 items that were retained from Study 1. Participants were provided with the prompt, “When I’m playing video games and someone FRUSTRATES me (prevents me from achieving my goal)...”, and they were asked to respond to items assessing likelihood of cathartic coping responses. Participants responded using a 4-point response format, ranging from

1 = *very uncharacteristic of me* to 4 = *very characteristic of me*. A typical item on the CIV-C is, “slammed my hand against the table.” In the present study, the Cronbach’s alpha for the 9-item CIV-C was .85.

**CIV-S.** The CIV-S is purported to assess self-blaming coping responses to frustration in video games. It contains the 9 items that were retained from Study 1. Participants were provided with the prompt, “When I’m playing video games and someone FRUSTRATES me (prevents me from achieving my goal)...”, and they were asked to respond to items assessing self-condemning coping responses. Participants responded using a 4-point response format, ranging from 1 = *very uncharacteristic of me* to 4 = *very characteristic of me*. A typical item on the CIV-S is, “blamed myself.” In the present study, the Cronbach’s alpha for the 9-item CIV-S was .92.

**CIV-III.** The CIV-III is the combined scale of the CIV-A, CIV-C, and CIV-S. The scale is purported measure maladaptive (harmful) coping in video games. It contains the 27 items across the three factors, CIV-A, CIV-C, and CIV-S measures: aggression (9 items), catharsis (9 items), and self-condemnation (9 items), respectively. In the present study, the Cronbach’s alpha for the 27-item CIV was .89.

**AQ –Anger Subscale.** This measure is described in detail in Study 1. In the present study, the Cronbach’s alpha for the Anger subscale was .72.

**Arousal Predisposition Scale (APS;** Coren, 1988). The APS is a 12-item measure that is purported to measure arousability. Examples from the scale include, “I get excited easily,” and “my mood is quickly influenced by entering new places.” Participants can respond using a 5-point response format, ranging from 1 = *never (or almost never)* to 5 = *always (or almost always)*. Previous research using the APS has found a Cronbach’s alpha of .84 (Coren, 1988). The APS has been found to have evidence supporting its construct validity using physiological

measures of arousal, including electromyographic response and electrodermal activity (Coren, 1993). It has also had evidence supporting its criterion validity with six domains of sleep disturbance (Coren, 1988). In the present study, the Cronbach's alpha for the APS was .81.

**Procedure.** Based on the advantages, limitations, and considerations of online data collection outlined by Granello and Wheaton (2004), as well as our technologically-oriented target population of gamers, I determined that online data collection would be appropriate. Data were collected and managed using REDCap (Research Electronic Data Capture) tools hosted through Virginia Commonwealth University (Harris et al., 2009). REDCap is a secure, web-based application designed to support data capture for research studies. Participants could participate in the online survey anywhere they had an internet connection. Upon accessing the survey, participants gave informed consent, and they were debriefed upon completing the survey.

## **Results**

Data were cleaned and study measures created using IBM Statistics SPSS – Version 24 (IBM Corp., 2014). That data were checked for lack of normality, linearity, and homoscedasticity of the residuals through examination of basic statistics and histograms. Because less than 2% of the item-level data were missing, findings may be considered free of bias typically attributed to incomplete data (Tabachnick & Fidell, 2001). I have reported the findings of Study 2 in three parts. First, I provide information regarding means, standard deviations, estimates of internal consistency, and bivariate correlations of all Study 2 variables (see Table 2).

Second, to determine the replicability of the structure identified in Study 1, I conducted confirmatory factor analyses (CFAs) on the three coping scales created Study 1. Furthermore, based on the high correlations among the three coping scales found in Study 1 (suggesting a

possible higher-order factor), I computed a CFA on the entire CIV measure (i.e., CIV-III), treating each scale – aggression, catharsis, and self-condemnation – as a subscale.

Table 2

*Means, Standard Deviations, Estimates of Internal Consistency, and Bivariate Correlations (Study 2) (N = 135).*

Measure	<u>Bivariate Correlations</u>					$\alpha$	M (SD)	# of items (rating scale)
	1	2	3	4	5			
1. CIV-A	-	.40**	.01	.28**	.14	.88	10.32(4.09)	6 (1-4)
2. CIV-C		-	.17*	.30**	.19*	.79	8.96(3.37)	5 (1-4)
3. CIV-S			-	.12	.25*	.92	10.46(4.24)	5 (1-4)
4. AQ-Anger				-	.41**	.72	22.06(7.12)	7 (1-7)
5. APS					-	.81	35.64(7.44)	12 (1-5)

*Note.* As will be seen as a consequence from subsequent analyses, the number of items in the CIV-A, CIV-C, and CIV-S was reduced from the 9 items in Study 1 (see below for analyses).

\* $p < .05$

\*\* $p < .01$

Third, to establish further evidence for construct validity, I computed a path analysis using two measures of personality associated with stress and coping – anger and arousal predisposition. I first computed a main effects model, providing evidence for the predictive value of these personality traits on the CIV scales. I then computed an interaction model, which examined the moderating effect of arousal predisposition on the relationship between anger and the CIV scales. Finally, I computed a simple slopes analysis to determine the nature of the interaction effects found in the moderation analysis.

**Confirmatory Factor Analyses.** To assess whether the single-factor structure observed in the EFAs in Study 1 would replicate in a separate sample (Hypothesis 1), I conducted three confirmatory factor analyses (CFAs) on the CIV-A, CIV-C, and CIV-S. Several fit indices were examined to evaluate the overall fit of the model: the Chi-square value (nonsignificant is ideal, but  $\chi^2/df < 4$  is good; DeVellis, 2012), the comparative fit index (CFI), the square-root-mean-

residual (SRMR), and the root-mean-square error of approximation (RMSEA). As a general rule, a CFI around 0.95, an SRMR equal to or less than 0.08, and an RMSEA equal to or less than .06 suggest good fit (Hu & Bentler, 1999).

**CIV-A.** To assess whether the single-factor structure observed in the split-sample EFAs in Study 1 would replicate in a separate sample, a CFA was computed on the 9-item CIV-A. The overall fit for the specified single-factor model was insufficient,  $\chi^2(27) = 175.573$ ,  $p < .001$ ,  $\chi^2/df = 6.503$ , CFI = 0.794, SRMR = .085, RMSEA = 0.198, 95% CI [0.171-0.227]. Due to the strong theoretical rationale for a single factor structure (aggression), as well as the convincing results of the split-sample EFA conducted in Study 1, I sought to winnow the items from the 9-item measure to better fit the model and retain the same content validity. I therefore eliminated three redundant items from the CIV-A (e.g., removed “intentionally performed poorly” and “stopped supporting my teammates efforts” and retained “trolled (intentionally worked against my teammates’ goals)”). I conducted a second CFA on the remaining 6 items of the CIV-A. The overall fit with the model was excellent,  $\chi^2(9) = 13.869$ ,  $p = .127$ ,  $\chi^2/df = 1.541$ , CFI = 0.987, SRMR = .029, RMSEA = 0.062, 95% CI [0.000-0.123]. The 6-item CIV-A had an estimated internal reliability (Cronbach’s  $\alpha$ ) of .88.

**CIV-C.** To assess whether the single-factor structure observed in the split-sample EFAs in Study 1 would replicate in a separate sample, a CFA was computed on the 9-item CIV-C. The overall fit for the specified single-factor model was insufficient,  $\chi^2(27) = 113.631$ ,  $p < .001$ ,  $\chi^2/df = 4.209$ , CFI = 0.805, SRMR = .078, RMSEA = 0.151, 95% CI [0.123-0.181]. Due to the strong theoretical rationale for a single-factor structure (e.g., catharsis), as well as the convincing results of the split-sample EFA conducted in Study 1, I sought to winnow the items from the 9-item measure to better fit the model and retain the same content validity. I therefore eliminated four

redundant items from the CIV-C (e.g., removed “took it out on the things around me” and retained items that specifically captured that behavior, such as “threw things”). I conducted a second CFA on the remaining 5 items of the CIV-C. The overall fit with the model was excellent,  $\chi^2(5) = 8.529$ ,  $p = .129$ ,  $\chi^2/df = 1.706$ , CFI = 0.981, SRMR = .031, RMSEA = 0.071, 95% CI [0.000-0.150]. The 5-item CIV-C had an estimated internal reliability (Cronbach’s  $\alpha$ ) of .79.

**CIV-S.** To assess whether the single-factor structure observed in the split-sample EFAs in Study 1 would replicate in a separate sample, a CFA was computed on the 9-item CIV-S. The overall fit for the specified single-factor model was insufficient,  $\chi^2(27) = 203.073$ ,  $p < .001$ ,  $\chi^2/df = 7.521$ , CFI = 0.813, SRMR = .077, RMSEA = 0.216, 95% CI [0.189-0.244]. Due to the strong theoretical rationale for a single factor structure (e.g., self-condemnation), as well as the convincing results of the split-sample EFAs in Study 1, I sought to winnow the items from the 9-item measure to better fit the model and retain the same content validity. I therefore eliminated four items from the CIV-S. The four removed items captured the characterological component of self-condemnation (e.g., “felt like a failure”), as opposed to the behavioral component (e.g., “felt guilty about something I said or did.”) (Schacter & Juvonen, 2015). The remaining 5 items encompassed the behavioral and ruminative characterizations of self-condemnation. I conducted a second CFA on the remaining 5 items of the CIV-S. The overall fit with the model was good,  $\chi^2(5) = 12.971$ ,  $p = .024$ ,  $\chi^2/df = 2.594$ , CFI = 0.984, SRMR = .021, RMSEA = 0.101, 95% CI [0.036-0.180]. The 5-item CIV-S had an estimated internal reliability (Cronbach’s  $\alpha$ ) of .92.

**CIV-III.** The significant correlations found between the CIV-A, CIV-C, and CIV-S in Study 1 suggested that there may be a higher-order factor influencing the CIV scores, thereby supporting their use as a single, three-factor scale. Therefore, I conducted a CFA specifying three

factors on the full 27-item CIV-III (9 items in each subscale). The overall fit for the specified three-factor model was inadequate,  $\chi^2(321) = 915.555, p < .001, \chi^2/df = 2.852, CFI = 0.745, SRMR = .088, RMSEA = 0.115, 95\% CI [0.106-0.124]$ . This was expected, based on inadequate fit of the three aforementioned individual CFAs computed on the CIV subscales—each of which had redundant items.

Therefore, I computed a second CFA on the full three-factor CIV-III measure, this time using the 16 items retained from the CFAs in Study 2 (CIV-A, 6 items; CIV-C, 5 items; and CIV-S, 5 items) and specifying three factors. The overall fit with the model was excellent,  $\chi^2(101) = 178.910, p < .001, \chi^2/df = 1.771, CFI = 0.931, SRMR = .064, RMSEA = 0.074, 95\% CI [0.056-0.092]$ . The 16-item CIV had an estimated internal reliability (Cronbach's  $\alpha$ ) of .82.

**Main effects model.** To provide evidence for the construct validity of the CIV scales, I conducted a path analysis that assessed the relationship between two personality traits associated with stress and coping (anger and arousal predisposition) and the CIV scales (see Figure 1). In the first structural model, I analyzed the main effects of anger and arousal predisposition on the three CIV scales (aggressive coping, CIV-A, cathartic coping, CIV-C; and self-condemnation, CIV-S). Consistent with Hypotheses 2 and 3, the paths from anger to aggressive coping ( $B = .180, p = .003$ ) and to cathartic coping ( $B = .131, p = .002$ ) were significant and positive. Consistent with Hypothesis 4, the path from anger to self-condemnation was nonsignificant ( $p = .837$ ). Thus my results suggest that, while anger is a positive predictor of aggressive and cathartic coping strategies, it is not a predictor of self-condemnation.

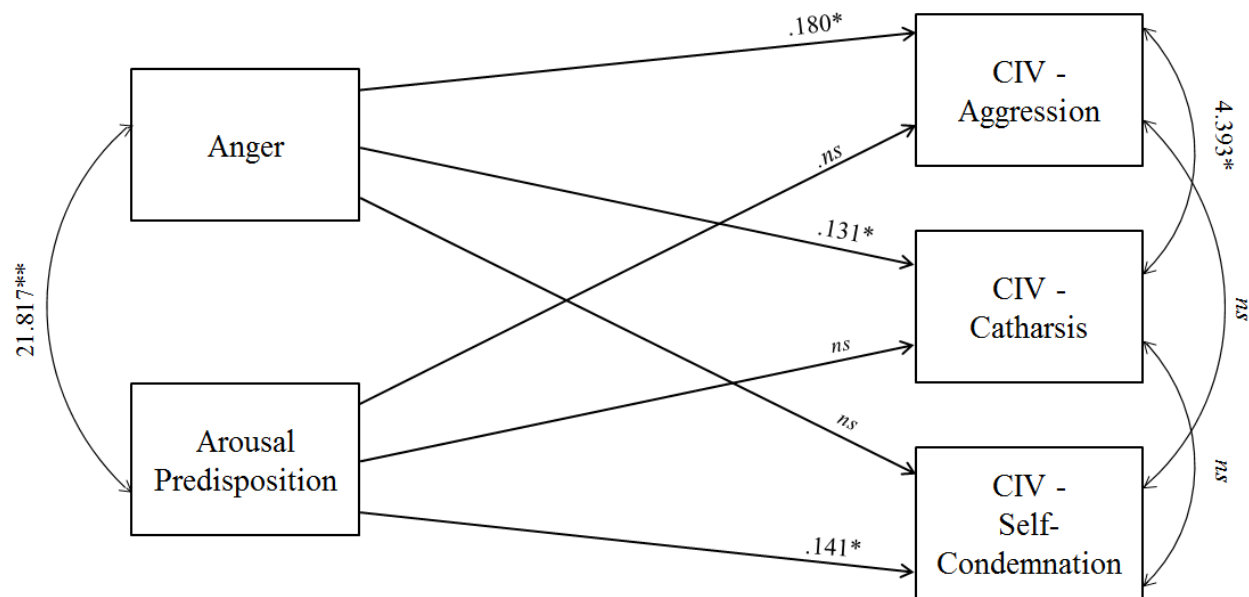
Inconsistent with Hypotheses 5 and 6, the paths from arousal predisposition to both aggressive coping and cathartic coping were nonsignificant ( $p = .904, p = .50$ , respectively).



However, consistent with Hypothesis 7, the path from arousal predisposition to self-condemnation was positive and significant ( $B = .141, p = .002$ ). Thus my results suggest that, while arousal predisposition is not a significant predictor of aggressive and cathartic coping strategies, it is a positive predictor of self-condemnation.

Figure 1

Illustration of the main effects of anger and arousal predisposition on CIV coping strategies in Study 2 (main effects model).



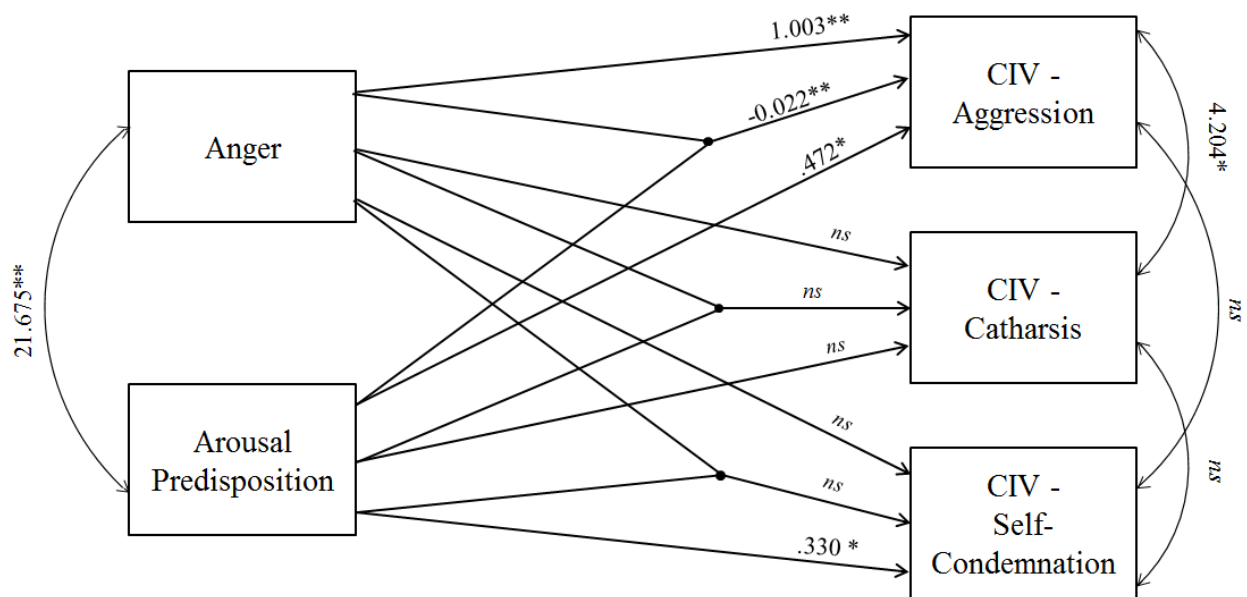
**Moderation model.** In the final model, I introduced the joint effect of anger and arousal predisposition to predict the aggressive, cathartic, and self-condemning coping strategies measured by the CIV scales. Evaluation of the BIC produced evidence that the interaction model ( $BIC = 15356.630$ ) fit the data equally as well as the main effects model ( $BIC = 15255.675$ ; Raftery, 1996).

My hypotheses were partially supported (See Figure 2). The inclusion of the interaction term, anger ( $B = 1.003, p < .001$ ) and arousal predisposition ( $B = .472, p = .001$ ), was related significantly to aggressive coping ( $B = -0.022, p < .001$ ). The inclusion of the interaction term,

anger ( $B = .194, p = .348$ ) and arousal predisposition ( $B = .065, p = .544$ ), was not related significantly to cathartic coping ( $B = -0.002, p = .747$ ). And finally, the inclusion of the interaction term, anger ( $B = .333, p = .165$ ) and arousal predisposition ( $B = .330, p = .036$ ), was not related significantly to self-condemnation as a coping strategy ( $B = -0.009, p = .182$ ).

Figure 2

Illustration of the main effects and interaction effects of anger and arousal predisposition on CIV coping strategies in Study 2 (interaction model).

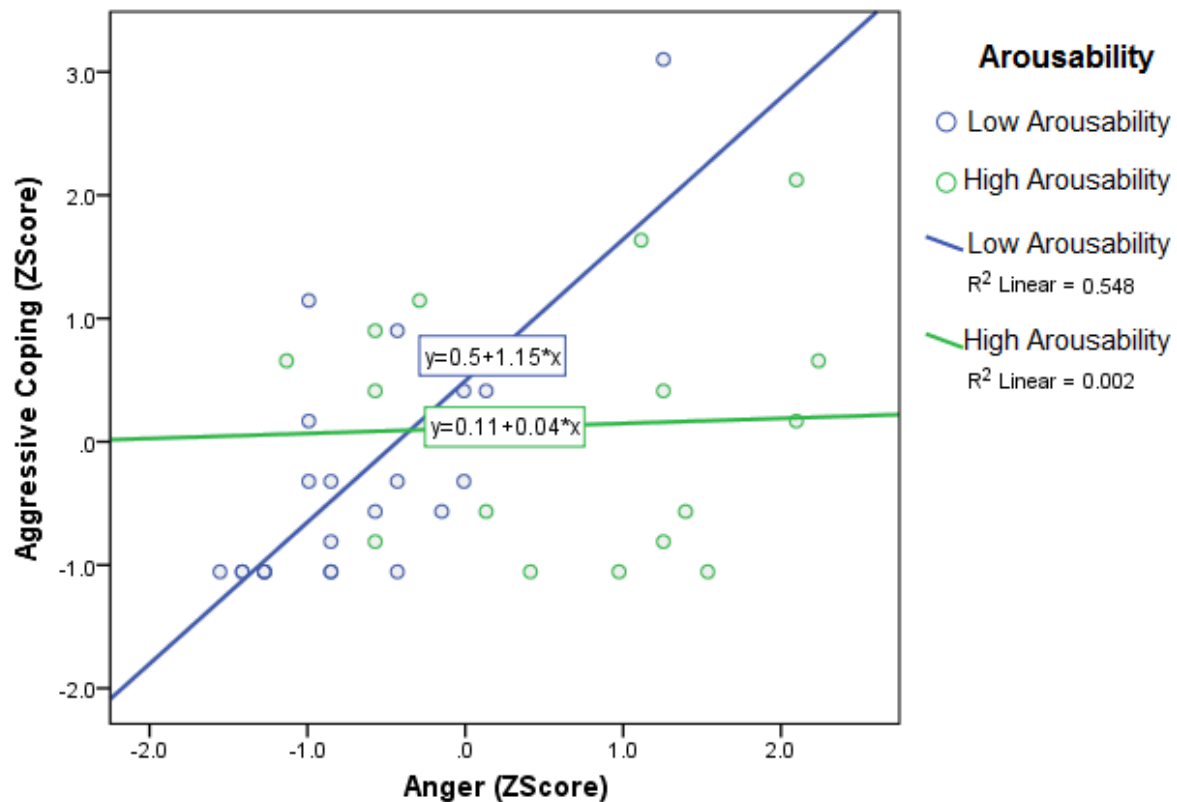


To explore how the relationship between anger and aggressive coping is moderated by arousal predisposition, I conducted an analysis of simple slopes. I hypothesized that arousal predisposition would moderate the relationship between anger and aggressive coping. Specifically, I expected that higher levels of arousal predisposition would dampen the positive relationship between anger and aggressive coping in video games. I tested this hypothesis using hierarchical regression outlined by Aiken and West (1991). The predictor and moderator variables were standardized to aid interpretation and reduce multicollinearity. As depicted in Figure 2, my hypothesis was supported: at low levels of arousal predisposition, anger was a

significant positive predictor of aggressive coping ( $B = .669, p < .001$ ). At high levels of arousal predisposition, anger was not a significant predictor of aggressive coping ( $B = .085, p = .451$ ).

Figure 3.

Illustration of the moderation effect of arousal predisposition on anger and aggressive coping.



## Discussion of Study 2

In Study 2, I provided further evidence of the single-factor structure found across the three CIV scales (CIV-A, CIV-C, and CIV-S) in Study 1. Furthermore, I determined that the three CIV scales can be combined into a single, three-factor scale, while still maintaining adequate fit. Additionally, I found that two personality characteristics associated with stress and coping – anger and arousal predisposition – are predictive of CIV scale scores. Specifically, trait anger was predictive of both aggressive and cathartic coping strategies (but not self-condemnation). Arousal predisposition was predictive of self-condemnation (but not aggression

and catharsis). Moreover, I found an interaction effect of arousal predisposition and anger on aggressive coping: participants who endorsed low arousal predisposition had a significant, positive relationship between anger and aggressive coping; however, participants who endorsed high arousal predisposition had no significant relationship between anger and aggressive coping.

Inconsistent with the findings of Study 1, not all CIV scales were inter-correlated: aggressive coping and self-condemnation were not correlated significantly. Because of the considerable correlation found between these variables in Study 1 ( $r = .341, p < .001$ ), further work needs to be done to understand the relationship between these variables.

The majority of my findings regarding the predictive value of anger and arousal predisposition on CIV coping strategies were consistent with my hypotheses and the current literature. Anger was a positive predictor of aggressive coping, which is consistent with the conceptualization of anger as a core component of aggression (Buss & Perry, 1992). Anger was also a positive predictor of cathartic coping, which is consistent with the modern definition of catharsis, wherein it is used to expel aggressive thoughts and feelings (i.e., hostility; Bushman, 2002). This is especially true with Buss and Perry's (1992) definition of anger, as the physiological arousal associated with aggression. This definition also is consistent with the significant and strong relationship identified between anger and arousal predisposition. Anger, however, was not a significant predictor of self-condemning coping. Anger, as it is measured by the BPAQ (Buss & Perry, 1996), involves outward expression of negative feelings (e.g., "When frustrated, I let my irritation show"). The self-targeting, isolated nature of self-condemnation would therefore not be captured by the anger items. Thus, the relationships between trait anger and the CIV scales provide further evidence for construct validity.

Study 2 also found that arousal predisposition was not a significant predictor of aggression. These findings contradict some literature suggesting a negative relationship between these variables (Coren, 1999; Woods & White, 2005). However, other research has suggested that arousal predisposition acts as a moderator of aggressive behavior – that low arousability is a protective factor against aggressive behavior (Raine, Venables, & Williams, 1993). My findings were consistent with this conjecture. As demonstrated by the path and simple slopes analyses, as arousability increased, the positive and significant relationship between anger and aggressive behavior was nullified. Also consistent with my hypotheses, I found a positive and significant relationship between arousal predisposition and self-condemning coping. This is likely due to the shared component of affective rumination. One characteristic of arousal predisposition is the persistence of emotional reactions, even hours after the emotional stimulus was received (Coren, 1988). The items of the CIV-S capture that same characteristic (i.e., affective rumination), wherein the individual is persistently thinking about the frustrating stimulus and his or her reaction to it.

Inconsistent with my hypotheses and the literature (Buss & Perry, 1992; Coren, 1988), arousal predisposition was not a significant predictor of cathartic coping. This finding was surprising, as arousability possesses many of the same components of cathartic coping (e.g., physiological arousal) captured in the CIV-C. This could perhaps be due to the mixed relationship between arousability and the CIV-C items. Previous research suggests that there is a negative relationship between arousal predisposition and the outward expression of that arousal (Coren, 1999). This is perhaps due to differing thresholds for action that low-arousability and high-arousability individuals experience. For example, it explains why individuals with a lower arousal predisposition (and, thus, lower arousal thresholds) are more likely to commit delinquent

acts that individuals with higher arousability thresholds. (These findings were supported by the moderation analysis in this study). This theory, referred to as the “underarousal hypothesis” (Coren, 1999) suggests a negative relationship between arousal predisposition and CIV-C scores (i.e., the outward expression of that arousal). However, there is also significant overlap in this study’s conceptualization of arousal predisposition and catharsis, captured in the items assessing physiological arousal. This overlap would suggest a positive relationship between arousal predisposition and CIV-C scores. It is possible, then, that these two conflicting relationships nullified one another, thus creating a nonsignificant relationship. However, further research would need to be conducted to clarify the nature of this relationship.

### **Study 3**

In Study 3, I first conducted a Confirmatory Factor Analysis (CFA) to determine whether the three-factor structure of the CIV observed in Studies 1 and 2 would replicate in a separate sample. Second, I conducted a Latent Profile Analysis (LPA) to assess how each of the coping strategies measured by the CIV – aggression, catharsis, and self-condemnation – are used in relation to one another. Namely, the LPA created coping profiles for the sample of gamers. Moreover, with the LPA, I determined what proportion of the sample fell into each profile category. Finally, I conducted two sets of four multiple regression analyses to determine whether personality characteristics (i.e., anger, arousal predisposition, and an external locus of control) and motivations for gameplay could predict the coping profiles of gamers.

### **Anticipated Theoretical Associations and Hypotheses**

I intended to use the empirical method of LPA to determine potential profiles. From the research to date, I might speculate that there are at least three anticipated profiles. In a sample of  $N = 354$  participants, Aldridge and Roesch (2008) conducted an LPA of general coping strategies

utilized by adolescents. Their results revealed three distinct coping profiles: low generic coping, approach coping, and passive coping. Based on these findings, I hypothesize that similar profiles will arise from the LPA of the CIV-III subscales. Individuals who report relatively low scores across all three CIV-III subscales – thus suggesting an even-tempered coping approach not captured by the CIV-III – would characterize a low maladaptive coping profile. Individuals who report relatively high scores on the CIV-A and CIV-C would characterize an externalized maladaptive coping profile (akin to the approach coping strategy; Aldridge & Roesch, 2008). Individuals who report relatively high scores on the CIV-S would characterize an internalized maladaptive coping profile (akin to the passive coping strategy; Aldridge & Roesch, 2008). However, because of the significant positive intercorrelations between all three CIV-III subscale scores, I also anticipate that a fourth coping profile would arise: a high maladaptive coping profile, characterized by relatively high scores across all three CIV-III subscales.

Below, I suggest hypotheses regarding which variables may predict coping profile membership; however, it is important to note that the following hypotheses were contingent on the results of the LPA conducted in Study 3. Based on the theoretical associations I described in Study 2, as well as the results in Study 2, I developed the following hypotheses:

**Anger and arousal predisposition.** (For more detailed information about these constructs, see Study 2). Due to the positive and significant relationships between anger, aggressive coping, and cathartic coping, I hypothesized that anger would be a negative predictor of the low maladaptive coping profile, and a positive predictor of the externalized maladaptive coping and high maladaptive coping profiles. Due to the nonsignificant relationship between anger and self-condemning coping, I hypothesized a nonsignificant relationship between anger and the internalized maladaptive coping profile.

Based on the nonsignificant relationships between arousal predisposition and both aggressive coping and cathartic coping, I hypothesized nonsignificant relationships between arousal predisposition and the low maladaptive coping, externalized maladaptive coping, and high maladaptive coping profiles. Due to the positive and significant relationship between arousal predisposition and self-condemning coping, I hypothesize a positive and significant relationship between arousal predisposition and the internalized maladaptive coping profile.

**External locus of control.** External locus of control (specifically for success and failure) is characterized by an individual's tendency to attribute successes and failures to an external cause (Epstein & Komorita, 1971). It is a critical component of the stress-and-coping model (Lazarus, 1993), wherein it determines how much control one believes they have in the face of a stressor (Folkman, 1984). While an internal locus of control seems to be the conceptual opposite of an external locus of control, the two are distinct constructs (Epstein & Komorita, 1971). Thus, an individual can endorse high beliefs in both (Epstein & Komorita, 1971). Some research has suggested that an internal locus of control is more conducive to adaptive coping patterns than an external locus of control (Parkes, 1984). Researchers have further specified that this is only true of those with moderately internal locus of control orientations, as opposed to extremely internal, extremely external, or moderate external locus of control orientations (Krause & Stryker, 1984). Based on the externalized nature of aggressive coping, I hypothesized that external locus of control would be a positive predictor of externalized maladaptive coping, a negative predictor of internalized maladaptive coping, and a nonsignificant predictor of high and low maladaptive coping profiles.

**Motivations for gaming.** With various different types of video games and players, there are individual differences in motivations for playing video games. The literature on the subject is



diverse, but there are some consistencies across studies (Bijvank, Konijn, & Bushman, 2012). One such study (Sherry, Lucas, Greenberg, & Lachlan, 2006) found six motivations: (1) *Competition*: to be the best player, (2) *Challenge*: to beat the game, (3) *Social interaction*: to have social experience, (4) *Diversion*: to pass time, (5) *Fantasy*: to have experiences one cannot have in real-life, and (6) *Arousal*: to get excited. Another study (Jansz & Martens, 2005) found four motivations: (1) Competition, (2) Sociality, (3) Interest, and (4) Relaxation. Yet another study (Yee, 2006) identified five motivations: (1) Relationship, (2) Manipulation, (3) Immersion, (4) Escapism, and (5) Achievement. In the present study, I will include the most comprehensive list of gaming motivations, as identified by Bijvank, Konijn, and Bushman (2012): social interaction, competition, fantasy-escape, fantasy-arousal, unwinding, challenge, and diversion.

Research has shown that different motivations are more emphasized across different game types. For example, for individuals who play Massively Multiplayer Online Role Playing Gamers (MMORPGs), social interaction is especially important (Griffiths, Davis, & Chappell, 2004). Research also has demonstrated that factors like age, gender, and educational ability influence video game motivations (Bijvank, Konijn, & Bushman, 2012; Yee, 2006). One study examined the role of Big-Five personality traits in video game experience (Johnson & Gardner, 2010). These experiences, as measured by the Player Experience of Need Satisfaction (PENS; Ryan, Rigby, & Przybylski, 2006), are also referred to as “motivations” by the authors. The study found that agreeableness is correlated positively with competence/control; emotional stability is correlated negatively with presence, and openness to experience is correlated positively with autonomy. Together, these findings suggest that differing motivations for video game play likely are associated with differing in-game behaviors.

In the present study, I examined how seven different video game motivations may predict membership across gamer coping profiles. It is important to note that the majority of research on motivations for video gaming is descriptive and observational – namely, studies seek to answer, “What are the motivations for gaming?”. Sparse research exists linking various video game motivations to other variables, and no research exists linking gaming motivations with in-game behaviors or coping strategies utilized by gamers. As such, my hypotheses for these analyses will be theoretically (as opposed to empirically) driven. Based on the principles of operant conditioning (Skinner, 1938), individuals will persist with behaviors that elicit desirable outcomes through the process of reinforcement. Therefore, gamers who are motivated by specific outcomes (e.g., unwinding) will be more likely to enact behaviors that elicit those outcomes. As such, I can hypothesize how gaming motivations might predict gamer coping profiles. I hypothesized that the LPA would yield four coping profiles: low maladaptive (low scores on all CIV-III subscales); externalized maladaptive (high on CIV-A and CIV-C); internalized maladaptive (high on CIV-S); and high maladaptive (high scores on all CIV-III subscales). The following seven motivations were assessed in the study: social interaction, competition, fantasy-escape, fantasy-arousal, unwinding, challenge, and diversion. As such, I have developed the following hypotheses:

Both the unwinding motivation (e.g., “I play my favorite game to vent anger”) and the cathartic coping strategy have the common underlying construct of catharsis. Therefore, I hypothesize that the profiles involving high CIV-C scores (externalized maladaptive and high maladaptive) will be predicted positively by the unwinding motivation; and that the low maladaptive profile (which involves low CIV-C scores) will be predicted negatively by unwinding. Similarly, there is a strong theoretical overlap between the fantasy arousal motivation

(e.g., “I play my favorite video game because it gets me excited”) and arousal predisposition, which I found was a significant predictor of self-condemnation in Study 2. Therefore, I hypothesize that the internalized maladaptive profile will be predicted positively by the fantasy-arousal motivation. Finally, the competitive motivation (e.g., “to be the strongest,) has a strong emphasis on being better than other players. Research shows that when individuals are subject to verbal aggression, they are more likely to perform poorly (Isberg, 2000). Thus, according to operant conditioning, players who are motivated by competitiveness may be more likely to verbally aggress other players. Therefore, I hypothesize that the externalized maladaptive and high maladaptive coping profiles (which include high CIV-A scores) will be positively predicted by the competitive motivation; and the low maladaptive coping profile (which includes low CIV-A scores) will be negatively predicted by the competitive motivation. I hypothesized nonsignificant relationships for the remaining four motivation variables.

## **Method**

**Participants.** To be considered for this study, participants must have (1) been at least 18 years of age, (2) played video games within the past six months that allow for communication between players, and (3) experienced frustration caused by another player while playing video games in the past six months. As a method check, participants were asked, “Over the past 6 months, have you gotten frustrated by another player while playing video games?” Participants must have responded “Yes” to proceed with the survey.

Of the 262 consented participants, 10 participant records were eliminated due to substantial numbers of incomplete responses (>25%), and an additional 1 participant record was eliminated due to failure to accurately respond to three of the five validation questions (i.e., please answer “D”). Undergraduate students from Virginia Commonwealth University were

recruited through their introduction to psychology classes ( $n = 229$ ). Participants were also recruited through campus and social media outreach, including university clubs and through online forums ( $n = 6$ ). The remaining ( $n = 16$ ) participants did not disclose their method of recruitment.

Of the participants,  $n = 122$  (49%) identified as female;  $n = 117$  (47%), as male; and the remaining  $n = 12$  (4%), as transgender or other. Participant ages ranged from 18 to 29 ( $M = 19.13$ ,  $SD = 1.76$ ). Of the participants,  $n = 84$  (36%) identified as Non-Hispanic White or Euro-American;  $n = 59$  (24%) as Black or African American,  $n = 31$  (12%) as East Asian or Asian American,  $n = 15$  (6%) as Middle Eastern or Arab American, and the remaining (22%), as a variety of other races or ethnicities. Based on the considerations outlined by Landers and Behrend (2015), for the use of convenience sampling and its threat to external validity, we determined that the target population of online gamers could be adequately captured through mixed online and university-based convenience sampling.

### **Measures.**

***BPAQ –Anger Subscale.*** This measure is described in detail in Study 1. In the present study, the Cronbach’s alpha for the Anger subscale was .80.

***Arousal Predisposition Scale.*** This measure is described in detail in Study 1. In the present study, the Cronbach’s alpha for the APS was .84.

***CIV-III.*** The CIV, developed across Studies 1 and 2, is purported measure maladaptive (harmful) coping in video games. It contains 16 items across three factors: the aggression subscale (CIV-A, 6 items), the catharsis subscale (CIV-C, 5 items), and the self-condemnation subscale (CIV-S, 5 items). Participants were provided with the prompt, “When I’m playing video games and someone FRUSTRATES me (prevents me from achieving my goal)...”, and they

were asked to respond to items assessing self-condemning coping responses. Participants responded using a 4-point response format, ranging from 1 = *very uncharacteristic of me* to 4 = *very characteristic of me*. In the present study, the Cronbach's alpha for the CIV-III was .90. Its subscales had alphas of .85, .82, and .94, for the CIV-A, CIV-C, and CIV-S, respectively.

***Motivations for Gaming Use Scale.*** (Bijvank, Konijn, & Bushman, 2012). The Motivations for Gaming Use Scale is purported to assess individuals' motivations for gaming across seven domains: social interaction, competition, fantasy-escape, fantasy-arousal, unwinding, challenge, and diversion. The scale consists of 22 items, with each domain containing between 2 and 5 items. Participants are presented with the prompt, "I play my favorite game because...", and may answer with ratings between 1 = *disagree completely* and 7 = *agree completely*. Previous research using the scale has found estimated internal reliabilities (Cronbach's alphas) as follows: social interaction (.89), competition (.71), fantasy-escape (.83), fantasy-arousal (.68), unwinding (.63), challenge (.73), and diversion (.62). In the present study, the Cronbach's alphas for the subscales were as follows: social interaction (.90), competition (.91), fantasy-escape (.83), fantasy-arousal (.87), unwinding (.77), challenge (.85), and diversion (.50).

**Procedure.** Based on the advantages, limitations, and considerations of online data collection outlined by Granello and Wheaton (2004), as well as the technologically-oriented target population of gamers, I determined that online data collection would be appropriate. Data were collected and managed using REDCap (Research Electronic Data Capture) tools hosted through Virginia Commonwealth University (Harris et al., 2009). REDCap is a secure, web-based application designed to support data capture for research studies. Participants could participate in the online survey anywhere they had an internet connection. Upon accessing the

online survey, participants gave informed consent, and they were debriefed after completing the survey.

## **Results**

Data were cleaned and study measures created using IBM Statistics SPSS – Version 24 (IBM Corp., 2014). That data were checked for lack of normality, linearity, and homoscedasticity of the residuals through examination of basic statistics and histograms. Because less than 2% of the item-level data were missing, findings may be considered free of bias typically attributed to incomplete data (Tabachnick & Fidell, 2001).

I have presented the results of Study3 in four parts. First, I provide means, standard deviations, estimates of internal consistency, and bivariate correlations of all Study 3 variables (see Table 3). Second, to determine the replicability of the three-factor structure identified in Study 2, I conducted a confirmatory factor analysis on the CIV-III. Third, I conducted a Latent Profile Analysis (LPA) to assess how each of the coping strategies measures by the CIV – aggression, catharsis, and self-condemnation – are used in relation to one another, thus creating coping profiles for the current sample of gamers. Finally, I assess the ability of several variables to predict the gamers’ coping profile. Specifically, I examine personality traits associated with stress and coping (anger, arousal predisposition, and external locus of control) and the gamers’ motivation for gameplay, and how they may predict coping profile membership.

**CFA.** To assess whether the three-factor structure observed in Study 2 would replicate in a separate sample, a CFA was computed on the 16-item CIV-III. The overall fit for the specified single-factor model was excellent,  $\chi^2(101) = 190.391, p < .001, \chi^2/df = 1.885, CFI = 0.963, SRMR = .045, RMSEA = 0.059, 95\% CI [0.046-0.072]$ . Thus, the CIV-III may be used as a three-factor measure of maladaptive coping in video games.

Table 3

*Means, Standard Deviations, Estimates of Internal Consistency, and Bivariate Correlations (Study 3) (N = 251).*

Measure	Bivariate Correlations												
	1	2	3	4	5	6	7	8	9	10	11	12	13
1. CIV-A	-												
2. CIV-C	.625*	-											
3. CIV-S	.247*	.373*	-										
4. AQ-A	.268*	.296*	.272*	-									
5. APS	.084	.147	.223*	.495*	-								
6. LCSF-E	.210*	.150	-.008	.284*	.119	-							
7. M-S	.042	.017	.117	.024	.101	.131	-						
8. M-Co	.268*	.186*	.098	.165	-.005	.148	.330*	-					
9. M-FE	.157	.237*	.069	.209*	.180*	.085	.189*	.438*	-				
10. M-FA	.058	.219*	.217*	.145	.211*	-.114	.289*	.435*	.550*	-			
11. M-U	.225*	.218*	.163	.243*	.168	.198*	.244*	.369*	.419*	.468*	-		
12. M-Ch	.029	.101	.057	.057	-.049	-.085	.254*	.454*	.263*	.459*	.376*	-	
13. M-D	.099	.164	.093	.138	.147	.100	.123	.267*	.170*	.178*	.182*	.317*	-
$\alpha$	.85	.82	.94	.80	.84	.83	.90	.91	.83	.87	.77	.85	.50
M	11.05	9.24	10.07	24.12	36.10	12.56	18.95	15.73	7.57	18.87	12.51	9.19	7.89
SD	.399	3.55	4.30	7.94	7.40	4.37	7.63	6.28	3.62	5.41	4.13	3.02	2.72

Note. \*p < .01

**LPA.** According to Tein, Coxé, and Cham (2013), several fit statistics may be used for LPA model selection. In the present study, I used three different methods of determining the most appropriate LPA model: Akaike's Information Criterion (AIC), Bayesian Information Criterion (BIC), and Entropy, which have been identified as the three most common selection criteria for LPA model fit (Tein, Coxé, & Cham, 2013). AIC and BIC are indicators of relative fit based on maximum-likelihood estimates (Tein, Coxé, & Cham, 2013). The Entropy index is a measure of uncertainty of classification, or separation between profiles (Tein, Coxé, & Cham, 2013). When comparing models, lower AIC and BIC values suggest a better relative fit, and higher entropy values suggest greater discrimination between profiles. An entropy value greater than 0.80 suggests that the latent profiles are highly discriminating (Tein, Coxé, & Cham, 2013).

In Table 4, I have presented the model fit statistics (AIC and BIC) and classification quality statistics (entropy) from four LPAs conducted in Study 3. Because AIC and BIC are indicators of relative fit, several models were run to determine the most likely classification.

Table 4

*Relative Model Fit and Entropy Statistics from Latent Profile Analysis (Study 3) (N = 251).*

Model	# of Classes	% in each class	AIC	BIC	Entropy
1	2	43, 57	13337.608	13552.611	0.981
2	3	42, 33, 25	12641.084	12937.223	0.957
3	4	42, 26, 23, 9	12220.196	12597.420	.976
4	5	35, 22, 17, 18, 8	11879.374	12337.683	.973

Based on the model fit and classification quality statistics provided in Table 4, I determined that Models 3 and 4 are the most likely candidates for the profile model structure. Therefore, I compare the CIV subscale means across the classes from Models 3 and 4, which would thus explain the nature of the classes. Furthermore, I compare these class subscale means to the subscale means of the entire sample. This comparison provides an initial understanding of the nature of the class distinctions, relative to the sample as a whole.

When compared to the sample means, the Model 3 classifications can be identified as follows: Class 1 contains relatively low means across all three subscales. Therefore, I named Class 1 the “Low maladaptive coping” profile, which encompasses 42% of the sample. Class 2 contains relatively high aggression (CIV-A) and catharsis (CIV-C) means, and an average-to-low self-condemnation (CIV-S) mean. Therefore, I named Class 2 the “Externalized maladaptive coping” profile, which encompasses 26% of the sample. Class 3 contains relatively average-to-low aggression and catharsis means, and a high self-condemnation mean. Therefore, I called Class 3 the “Internalized maladaptive coping” profile, which encompasses 23% of the sample. Class 4 contains relatively high means across all subscales. Therefore, I called Class 4 the “High



maladaptive coping” profile, which encompasses 9% of the sample. These findings are consistent with my hypotheses for the study.

Model 4 contained a very similar profile classification as Model 3. However, Model 4 contained an additional profile (identified as Model 4, Class 2 in Table 5). Overall, this profile’s subscale mean scores greatly resembled the subscale means of the sample as a whole. This may be considered an “average” coping profile. The addition of such a class did not significantly contribute to the understanding of gamers’ coping behavior. Moreover, the inclusion of a fifth class reduced the quality of distinction of the classes (i.e., entropy value), and did not drastically increase relative fit. Therefore, I determined that Model 3, with 4 profile identifications (low maladaptive coping, externalized maladaptive coping, internalized maladaptive coping, and high maladaptive coping), was the most likely model structure for the latent profile analysis conducted in Study 3.

**Predictors of profile membership.** To determine whether personality traits (i.e., anger, arousal predisposition, and an external locus of control) and motivations for gameplay can predict gamers’ coping profiles, I conducted two sets of four multiple regressions. In each of the multiple regressions, I dummy-coded coping profile membership. For example, when predicting membership in the externalized maladaptive coping profile, I created the variable “Externalized-Dummy.” All members who belonged to that profile were coded as “1,” and all members who did not belong to that profile were coded as “0.” This process was repeated across all four profiles. I then used these dummy variables as the dependent variables in the regression analyses. In the first set, I simultaneously included anger, arousal predisposition, and external locus of control as the predictor variables. In the second set, I simultaneously included seven different motivations to play video games as the predictor variables. Therefore, with each of the

regressions, I was able to determine which variables could significantly predict membership in the specific coping profile, relative to the other coping profiles.

Table 5

*LPA Models 3 and 4 Class Distinctions and Subscale Means (Study 3) (N = 251).*

Model	Class	% of Sample	Subscale Mean Scores		
			CIV-A	CIV-C	CIV-S
3	1	42	8.73	6.84	6.30
	2	26	14.23	12.11	9.85
	3	23	9.39	8.47	14.63
	4	9	16.51	14.41	16.72
4	1	35	8.81	6.91	5.63
	2	22	10.61	8.24	10.36
	3	17	15.58	13.81	9.62
	4	18	9.22	8.58	15.22
	5	8	16.22	14.17	16.90
Full Sample (N = 251)			10.32	8.96	10.46

*Note:* All classifications,  $p < .001$

***Personality traits and coping profiles.*** To determine whether anger, arousal predisposition, and external locus of control could predict membership in the gamer coping profiles, four multiple linear regression analyses were conducted. Standardized Beta Coefficients ( $\beta$ ) were examined to determine individual predictors. The overall model for the *low maladaptive coping profile* was significant,  $F(3, 266) = 9.884, p < .001, R^2 = .117$ . Together, anger, arousal predisposition, and external locus of control accounted for 11.7% of the variance in profile membership. Fully consistent with my hypotheses, anger ( $\beta = -.286, p < .001$ ) was a significant negative predictor of profile membership, whereas arousal predisposition ( $p = .222$ ) and external locus of control ( $p = .834$ ) were not significant predictors. Thus, individuals low in anger are more likely to be members of the low maladaptive coping profile (relative to the other profiles).

The overall model for the *externalized maladaptive coping profile* was significant,  $F(3, 266) = 6.023, p = .001, R^2 = .075$ . Together, anger, arousal predisposition, and external locus of control accounted for 7.5% of the variance in profile membership. Fully consistent with my hypotheses, anger ( $\beta = 1.962, p = .051$ ) and external locus of control ( $\beta = 3.053, p = .003$ ) were both significant positive predictors of profile membership, whereas arousal predisposition ( $p = .222$ ) was not a significant predictor. Thus, individuals high in anger and/or high in external locus of control are significantly more likely to belong to the externalized maladaptive coping profile (relative to other coping profiles).

The overall model for the *internalized maladaptive coping profile* was significant,  $F(3, 266) = 3.722, p = .012, R^2 = .048$ . Together, anger, arousal predisposition, and external locus of control accounted for 4.8% of the variance in profile membership. Fully consistent with my hypotheses, arousal predisposition ( $\beta = .159, p = .036$ ) was a positive predictor, and external locus of control ( $\beta = -2.182, p = .030$ ) was a negative predictor of profile membership, whereas anger ( $p = .570$ ) was not a significant predictor. Thus, individuals high in arousal predisposition and/or low in external locus of control are significantly more likely to belong to the internalized maladaptive coping profile (relative to other coping profiles).

The overall model for the *high maladaptive coping profile* was marginally significant,  $F(3, 266) = 2.515, p = .059, R^2 = .033$ . Together, anger, arousal predisposition, and external locus of control accounted for 3.3% of the variance in profile membership. Fully consistent with my hypotheses, anger ( $\beta = 2.506, p = .013$ ) was a significant positive predictor of profile membership, whereas arousal predisposition ( $p = .789$ ) and external locus of control ( $p = .318$ ) were not significant predictors. Thus, although the results are not as strong as the other profiles,

individuals high in anger are significantly likely to belong to the high maladaptive coping profile (relative to other coping profiles).

***Motivation for gaming and coping profiles.*** To determine whether gaming motivation could predict membership in the gamer coping profiles, four multiple linear regression analyses were conducted. The motivations for gaming included social interaction, competition, fantasy-escapism, fantasy-arousal, unwinding, challenge, and diversion. Standardized Beta Coefficients ( $\beta$ ) were examined to determine individual predictors. The overall model for the *low maladaptive coping profile* was significant,  $F(7, 227) = 4.481, p < .001, R^2 = .125$ . Together, motivations for gaming accounted for 12.5% of the variance in profile membership. Unwinding ( $\beta = -.161, p = .033$ ) and diversion ( $\beta = -.140, p = .038$ ) were significant negative predictors, and challenge ( $\beta = .178, p = .022$ ) was a significant positive predictor of profile membership. Social interaction ( $p = .926$ ), competition ( $p = .109$ ), fantasy-escape ( $p = .627$ ), and fantasy-arousal ( $p = .107$ ) were not significant predictors. Thus, individuals who endorse low unwinding and low diversion motivations, and/or high challenge motivation, are significantly more likely to belong to the low maladaptive coping profile (relative to other coping profiles).

The overall model for the *externalized maladaptive coping profile* was significant,  $F(7, 227) = 3.316, p = .002, R^2 = .095$ . Together, motivations for gaming accounted for 9.5% of the variance in profile membership. Competition ( $\beta = .185, p = .023$ ) and unwinding ( $\beta = .226, p = .003$ ) were both significant positive predictors of profile membership. Social interaction ( $p = .811$ ), fantasy-escape ( $p = .777$ ), fantasy-arousal ( $p = .496$ ), challenge ( $p = .173$ ), and diversion ( $p = .240$ ) were not significant predictors. Thus, individuals who endorse high competition and/or high unwinding motivations are significantly more likely to belong to the externalized maladaptive coping profile (relative to other coping profiles).

The overall model for the *internalized maladaptive coping profile* was nonsignificant,  $F(7, 227) = .748, p = .632, R^2 = .023$ . Together, motivations for gaming accounted for 2.3% of the variance in profile membership. Fantasy-arousal ( $\beta = .183, p = .04$ ) was a significant positive predictor of profile membership. Social interaction ( $p = .679$ ), competition ( $p = .697$ ) fantasy-escape ( $p = .741$ ), unwinding ( $p = .576$ ), challenge ( $p = .326$ ), and diversion ( $p = .574$ ) were not significant predictors. Thus, individuals who endorse high fantasy-arousal are significantly more likely to belong to the internalized maladaptive coping profile (relative to other coping profiles).

The overall model for the *high maladaptive coping profile* was nonsignificant,  $F(7, 227) = .452, p = .868, R^2 = .014$ . Together, motivations for gaming accounted for 1.4% of the variance in profile membership. None of the motivations significantly predicted membership in the high maladaptive coping profile: Social interaction ( $p = .913$ ), competition ( $p = .829$ ) fantasy-escape ( $p = .388$ ), fantasy-arousal ( $p = .524$ ), unwinding ( $p = .931$ ), challenge ( $p = .809$ ), and diversion ( $p = .422$ ).

### **Discussion of Study 3**

In Study 3, I provided further evidence of the three-factor structure of the CIV-III found in Study 2. CIV-III subscales were all significantly correlated in Study 3, which reflects the findings of Study 1 (but not Study 2). This provides further evidence of a higher-order factor influencing all three subscales. I suggest that this factor may represent an overall maladaptive coping approach to frustration in gaming.

Additionally, I conducted a Latent Profile Analysis (LPA) on the CIV-III subscales. This statistical analysis allows for researchers to understand how coping strategies are used in the context of one another. Coping is a complex process; it is not an isolated behavior (Lazarus, 1993; Aldridge & Roesch, 2008). By examining different profiles of multiple coping strategies, I

provide a more contextual understanding of coping in the gaming community. Results suggested that the most parsimonious classification included four coping profiles: low maladaptive coping, which accounted for 42% of the sample; externalized maladaptive coping, which accounted for 26% of the sample; internalized maladaptive coping, which accounted for 23% of the sample; and high maladaptive coping, which accounted for 9% of the sample. These results suggest several notable findings.

First, across the profiles, aggression and catharsis seemed to be consistently related to each other. The LPA suggests a strong relationship between the aggression and catharsis subscales. This supports the notion that catharsis is used to rid oneself of aggressive thoughts and feelings (Bushman, 2002). Moreover, this supports the findings of Studies 1 and 2. In those studies, the Pearson correlation coefficients between CIV-A and CIV-C scores ranged between .401 - .552,  $p < .001$ . And while this study did not demonstrate any causal effects, the strong positive relationship between aggression and catharsis supports the historical dismissal of catharsis theory – that catharsis does not discourage aggressive behavior (Hornberger, 1959; Geen, Stonner, & Shope, 1975).

Second, many gamers cope with frustration in game playing in unhealthy, destructive ways (Fox & Tang, 2013; Fox & Tang, 2014; Hughes, 2017). The LPA provides an approximate sample distribution of the maladaptive coping strategies. Results suggest that 42% of gamers represented by this sample endorse relatively low maladaptive coping; thus, 58% of gamers represented by this sample endorse some significant degree of maladaptive coping. Of those 58%, 26% cope through externalized destructiveness; 23% cope through internalized destructiveness; and the remaining 9% cope through both. These findings suggest that a significant portion of the gaming population represented by this sample is coping with video-

game based frustration in unhealthy ways. This supports the common notion and research suggesting that the gaming environment is notoriously “toxic” (Fox & Tang, 2013; Kuznekoff & Rose, 2013). These findings also reflected and built upon previous research using LPA to examine patterns of coping (Aldridge & Roesch, 2008). The classifications between active and passive coping profiles identified by Aldridge and Roesch (2008) are somewhat similar to the classifications between externalized and internalized coping profiles found in this study. However, while this study only encompassed maladaptive coping strategies, the 2008 study examined a broader range of coping strategies. This may be a strength to the study, as it allowed for a more nuanced examination of maladaptive coping. Yet this may also be a weakness to the study, as it failed to explain more positive coping strategies (i.e., the 42% of gamers who endorsed low maladaptive coping).

Finally, I conducted several multiple linear regressions to determine the predictive value of personality traits (i.e., anger, arousal predisposition, and external locus of control) and motivations for gaming on gamer coping profile membership. Regarding personality traits, my hypotheses were partially supported. I found that trait anger was associated with several of the coping profiles. This supports existing literature which suggests that trait anger is central to aggression and catharsis (Bushman, 2002; Buss & Perry, 1992) and predictive of maladaptive coping (Kochenderfer-Ladd, 2004). This is also consistent with the findings of the main effects model in Study 2, wherein there was a main effect of anger on aggressive and cathartic coping.

I also found that an external locus of control positively predicted externalized maladaptive coping and negatively predicted internalized maladaptive coping. A strong external locus of control means that an individual perceives external forces as having control in the face of a stressor (Folkman, 1984). As such, according to the stress-and-coping model (Lazarus,

1993), an individual would target their coping externally. Moreover, research has shown that an external (versus internal) locus of control orientation is associated with less adaptive coping patterns (Parkes, 1984). My findings are consistent with both of these theories regarding an external locus of control in the context of stress-and-coping.

Finally, Internalized maladaptive coping was predicted positively by arousal predisposition. These findings are consistent with the literature on arousal predisposition, wherein it is characterized by ruminative affect (Coren, 1999). These results also echo those found in Study 2.

Regarding motivations for gaming, my hypotheses were partially supported. I found that unwinding was a common predictor for several coping strategies. The unwinding motivation for gaming is characterized by a cathartic effect – that individuals play video games “to release aggression” or “to vent anger” (Bijvank, Konijn, & Bushman, 2012). With catharsis and aggression making up the majority of the maladaptive coping captured by the CIV-III, it makes sense that the unwinding motivation is predictive maladaptive coping strategies.

I found that low maladaptive coping was also predicted negatively by diversion, and positively by challenge. These findings were surprising. The diversion motivation is characterized by a distracting effect – that individuals play video games to counteract boredom or to take themselves away from other tasks. My findings suggest that those who use gaming for diverting purposes are less likely to have low maladaptive coping. This perhaps could be explained by a mediating role of attitudes towards the gaming community. If individuals are playing because “[they] have nothing better to do,” (as indicated by an item on the Diversion subscale; Bijvank, Konijn, & Bushman, 2012) they may be less committed to a healthy relationship with video games and the gaming community. This might then lead to less emphasis



on healthy, adaptive coping strategies to manage frustration caused by video games. However, further research would need to be conducted to provide evidence for such a mediating relationship. The challenge motivation is characterized by an appeal for the challenge of playing video games – I found that this was positively related to low maladaptive coping. This perhaps could be explained by the appraisal of the stressor (Folkman, 2013). Research suggests that, particularly among athletes, the appraisal of a stressor as an opportunity for growth is a healthy coping strategy (Mouratidis & Michou, 2011). Thus, gamers who are motivated by the challenge of video games may be more likely to enact adaptive coping strategies through growth-fostering stress appraisal.

Next, I found that competition was significantly predictive of externalized maladaptive coping. The competition motivation is characterized by a desire to be better than other players: “to be the best,” “to be the strongest,” and “to control the game” (Bijvank, Konijn, & Bushman, 2012). This motivation has an individualistic emphasis -- specifically on being better than other players. Thus, individuals with a competitive motivation may be less concerned on the negative impacts of their externalized coping. Moreover, research has found that being subject to verbal aggression is associated with decreased performance (Isberg, 2000). As such, harassing other players, as captured by the aggression component of externalized maladaptive coping, may actually increase a gamer’s chances of being better than his opponents. Through operant conditioning (Skinner, 1938), aggressing other players would be reinforced among gamers who are motivated by competition.

Next, I found that fantasy-arousal positively predicted internalized maladaptive coping. Fantasy-arousal is characterized by statements like, “it gets me excited,” “it makes me sit on the edge of my seat,” and “it is exciting to be somebody else.” Fantasy-arousal seems have

considerable overlap with arousal predisposition – which, as identified by Study 2, was a significant predictor of self-condemnation (the core component of the internalized maladaptive coping profile). Therefore, it would be consistent with my previous findings for fantasy-arousal to be a positive predictor of internalized maladaptive coping.

Finally, I found that high maladaptive coping had no significant motivation predictors. As previously noted, high maladaptive coping was characterized by high endorsements of all three CIV-III subscales. It is particularly surprising that unwinding was not a significant predictor; it was negatively predictive of low maladaptive coping (which is the conceptual opposite of high maladaptive coping), and positively predictive of externalized maladaptive coping (which is characterized by high scores on two of the three CIV-III subscales). It is possible that these findings are due to the nature of the analyses: the regressions tested whether or not motivations were more predictive of profile membership *relative to other profiles*. Thus, the findings do not suggest that motivations are unassociated with membership in the high maladaptive profile.

### **General Discussion**

Across a pilot study and three following studies, I developed a three-factor scale that allows assessment of gamers' responses to in-game frustration. Through Latent Profile Analysis, I found that less than half the sample of gamers (42%) do not endorse maladaptive coping: they were not prone to destructive behavior towards themselves, others, or objects around them; thus suggesting that they cope well with frustration. However, over half of the sample (58%) seems to demonstrate one of three patterns of maladaptive coping with in-game frustration.

### **Limitations**

There are several limitations to the study. The CIV-III is memory-based and self-reported, which increased the probability of biased responding. The CIV-III subscales need to be

compared to actual behaviors (i.e., video coding) to establish strong evidence for criterion-related validity. Because I also measured personality traits using self-report methods, the measurement error was increased similarly, and the results have potential shared method variance. Additionally, while the samples had considerable diversity in ethnicity and gender, the majority of participants were college-aged and college-educated. Therefore, results can be generalized only to this group. Because the average age of a gamer is their mid-thirties (ESA, 2015), and all samples had a mean age of approximately 20, it is important to retest these research questions in an older population.

Additionally, there was considerable subjectivity in these studies. The interpretation of the CIV-III subscales was subjective: their theorized constructs were based on the interpretation of items and their associations with personality traits that are known predictors of those constructs. Moreover, the interpretation of the LPA was subjective. Quantitative indicators, like AIC, BIC, and Entropy values were used to inform the most statistically sound model. However, the model selection was also informed by subjective parsimony: the inclusion of a fifth profile did not provide more “meaningful” information than the four-profile model. Though justifiable and supported by statistics, such idiosyncratic decisions are a limitation to the study.

Finally, the measure’s inclusion criterion involves all video games that may induce frustration caused by another player. This disqualifies single-player games. Additionally, research has shown that individuals endorse different types of behaviors (Hughes, 2017) and different motivations (Griffiths, Davis, & Chappell, 2004; Sherry, Lucas, Greenberg, & Lachlan, 2006) across different game types. Moreover, the experience of playing a video game in a public arcade versus alone at home provides a very different environmental context. Because the

environment is an important component of coping (Folkman, 1984; Lazarus, 1993), it is very likely that coping strategies would differ across gaming environments and game-types, as well.

### **Directions for Future Research**

Given the limitations of this research, future research should compare scores on the CIV-III subscales with actual coping behaviors – namely, to record and code these behaviors as they occur. Additionally, both self-report and third-party ratings should be used to measure personality traits, given the biases associated with self-report data. Also, given the disproportionate number of college-aged, college-education participants in these studies, these findings cannot be generalized outside of the population which these samples represent. It is important to retest these research questions in other populations. Additionally, situational differences (e.g., solo gameplay, gameplay in public arenas, different game-types, etc.) should be taken into consideration for future research.

Additionally, this study only focused on maladaptive coping strategies; adaptive coping strategies were not addressed. According to the findings of this study, 42% of gamers endorsed overall low maladaptive coping. This might suggest that they are using another, more adaptive coping strategy, like relaxation, goal setting, and achievement motivation (Mouratidis & Michou, 2011). Further research would need to be conducted to examine the healthy coping strategies used by gamers.

Future research also may consider a different theoretical foundation for video game-based coping. For example, this study primarily is grounded in the stress-and-coping model (Lazarus, 1993). It did not account for stress appraisal, which has been identified as a critical component of coping (Folkman, 2013). I instead used the blanket term “frustrated” in the measure’s instructions. While this provided a general and universal prompt, it is very likely that

participants had differing interpretations of frustration, and thus they likely had different appraisals of the stressor. In another example, self-determination theory (SDT; Deci & Ryan, 1985, 2002) suggests that individuals actively seek out challenges (i.e., frustrations) to achieve personal growth. This study did not address factors central to SDT, including perceptions of stressors, growth-oriented behaviors following the frustration, or the intentions behind or effectiveness of the coping strategy. Thus, our understanding of coping in video games can be expanded upon greatly from the inclusion of other theories of coping.

### **Implications for Practice and for General Use of Gaming**

The results of these studies open the doors for the examination of video game coping across various disciplines. Researchers in the social sciences may use this scale to better understand stress-and-coping as it exists in the gaming world. Due to the considerable amount of time people spend playing videogames (ESA, 2014, 2015), it is important to understand how gamers cope with the inevitable frustration that arises from playing video games. Clinicians may use this scale to better understand how their patients cope with stress, and how gaming may or may not be a detriment to their mental health. This would be particularly meaningful for patients who play video games for cathartic reasons (Bijvank, Konijn, & Bushman, 2012), or who maintain social relationships through playing video games. This scale may also find use in couples' therapy, as video games are a well-documented source of issue for marital couples (Lianekhammy & Van de Venne, 2015; Northrup & Shumway, 2014). The CIV-III may also be used to inform the meeting of some of the diagnostic criteria of video game addiction, like mood modification and harm (King, Delfabbro, & Griffiths, 2013).

Members of the gaming industry might also use this scale to help identify players who might pose a threat to the general health of the gaming community. The externalized maladaptive

coping strategy involves both verbal aggression (“raging”) and behavioral aggression (“trolling”), both of which negatively influence the emotional health of the community (Hughes, 2017). Moreover, while self-condemnation (internalized maladaptive coping) is a self-contained behavior, it is associated with negative mental health consequences (Graven et al., 2014; Kaur & Kaur, 2015). Both of these externalized and internalized strategies are associated with decreased performance (Good, Aronson, Inzlicht, 2003; Isberg, 2000), which ought to be of considerable interest to the gaming industry. With the recognition of eSports as an official sport by the United States Department of State (Tassi, 2013), this line of research also may find use in the field of sports psychology and vocational psychology.

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## Appendix A

### *Results of the Review of Available Tests and Measures*

<u>Construct</u>	<u>n</u>	<u>% total</u>	<u>Range Publication Yrs.</u>
Addiction/Problematic gaming	17	15.7	1995-2015
Feelings of connectedness (to game, avatar, etc.)	11	10.2	2007-2015
Motivation to play	10	9.3	2011-2015
Evaluation (ease of use, etc.)	9	8.3	2010-2015
Attitudes about gaming	8	7.4	2008-2014
Measure specific to particular game	8	7.4	2011-2013
Multifaceted (e.g., addiction and motivation)	8	7.4	2009-2014
Cheating	6*	5.5	2012-2013
Player engagement	4	3.7	2004-2015
Violence	4	3.7	2011-2015
Personality assessed in game context	3	2.8	1992-2004
Enjoyment/gratification	3	2.8	2010-2015
Habit-strength	2**	1.9	2014
Perceived negative effects of personal gaming	2	1.9	2011-2012
Preference for real or virtual environments	2	1.9	2009-2014
Gaming and dreams	2	1.9	2004-2008
Perceived third-player characteristics	2	1.9	2013-2015
Social behavior	2***	1.9	2014-2015
Emotional experience of game	1	<1	2014
Cognitive effort used in game	1	<1	2013
Non-social behavior coding scheme	1	<1	2015
Perceived anonymity in game	1	<1	2010
Report of personal skill level	1	<1	2015
Total	108		1992-2015
Proximally related to video gaming <sup>+</sup>	39	-	-
Unrelated to video gaming	108	-	-

\* 5 of the 6 measures originated from a single publication

\*\* Both measures originated from a single publication

\*\*\* One measure arose in the *PsycTESTS* search; the other was developed by the author

<sup>+</sup> “Proximally related” means that the measure contained an item related to video game use, but the measure itself was not directly related to video gaming (e.g., child sedentary behaviors).

## Appendix B

### *CIV-A, CIV-C, and CIV-S Item Sets and Retained Items from EFAs (Study 1)*

	<u>Retention (# retained items)</u>	
CIV-A	Subsample A (13)	Subsample B (14)
1. “was able to keep my frustration in check”	-	-
<b>2. “told off the person who frustrated me”</b>	<b>x</b>	<b>x</b>
<b>3. “scolded the person harshly”</b>	<b>x</b>	<b>x</b>
<b>4. “wanted to make the game more unpleasant for the person who frustrated me”*</b>	<b>x</b>	<b>x</b>
<b>5. “trolled (intentionally worked against my teammates’ goals)”</b>	<b>x</b>	<b>x</b>
<b>6. “got verbally aggressive with other players”</b>	<b>x</b>	<b>x</b>
7. “tried to redirect my focus for the good of other players”	-	-
<b>8. “said offensive things to others”*</b>	<b>x</b>	<b>x</b>
<b>9. “intentionally performed poorly”</b>	<b>x</b>	<b>x</b>
10. “tried to get revenge”	-	x
11. “said things to create a more supportive environment”	-	-
<b>12. “created a hostile environment for the other players”</b>	<b>x</b>	<b>x</b>
<b>13. “intentionally offended people”</b>	<b>x</b>	<b>x</b>
<b>14. “stopped supporting my teammates’ efforts”</b>	<b>x</b>	<b>x</b>
<b>15. “couldn’t help but to get hostile towards others”*</b>	<b>x</b>	<b>x</b>
<b>16. “got payback on the person who frustrated me”*</b>	<b>x</b>	<b>x</b>
17. “did something nice for someone”	-	-
<b>18. “blew off steam at the expense of the other players”</b>	<b>x</b>	<b>x</b>
CIV-C	Subsample A (13)	Subsample B (14)
1. “let my frustration fade away without doing anything”	-	-
<b>2. “slammed my hand against the table”</b>	<b>x</b>	<b>x</b>
<b>3. “yelled aloud, to no one in particular”</b>	<b>x</b>	<b>x</b>
<b>4. “threw things”</b>	<b>x</b>	<b>x</b>
<b>5. “got physically antsy”</b>	<b>x</b>	<b>x</b>
6. “stayed completely calm and collected”	-	-
<b>7. “damaged (or almost damaged) my keyboard or mouse from getting too worked up”*</b>	<b>x</b>	<b>x</b>
<b>8. “acted so negatively that people around me could tell I was frustrated”*</b>	<b>x</b>	<b>x</b>
9. “cracked my knuckles, neck, etc.)	-	-
10. “muttered criticizing things about the person who frustrated me”	-	x

11. <b>“acted violently towards things around me”*</b>	<b>x</b>	<b>x</b>
12. “did not behave any differently than when I was not frustrated”	-	-
13. <b>“damaged (or almost damaged) my keyboard or mouse from getting too worked up”</b>	<b>x</b>	<b>x</b>
14. <b>“yelled at the game itself”</b>	<b>x</b>	<b>x</b>
15. <b>“muttered nasty things in general”</b>	<b>x</b>	<b>x</b>
16. <b>“took it out on the things around me”</b>	<b>x</b>	<b>x</b>
17. <b>“wished I could hit something”*</b>	<b>x</b>	<b>x</b>
18. <b>“did something in-the-moment to blow off steam”</b>	<b>x</b>	<b>x</b>

CIV-S	Subsample A (18)	Subsample B (18)
1. <b>“blamed myself”</b>	<b>x</b>	<b>x</b>
2. <b>“criticized myself”*</b>	<b>x</b>	<b>x</b>
3. <b>“didn’t really give myself much slack”*</b>	<b>x</b>	<b>x</b>
4. <b>“felt disappointed about my reaction”*</b>	<b>x</b>	<b>x</b>
5. “didn’t really blame myself”	-	-
6. <b>“held myself responsible, even if it wasn’t my fault”*</b>	<b>x</b>	<b>x</b>
7. <b>“believed I was at fault”*</b> or mouse from getting too worked up”	<b>x</b>	<b>x</b>
8. <b>“got upset with myself”</b>	<b>x</b>	<b>x</b>
9. <b>“questioned why I acted in the way that I did”</b>	<b>x</b>	<b>x</b>
10. <b>“thought about what I could have done differently”*</b>	<b>x</b>	<b>x</b>
11. <b>“felt I had let myself down”</b>	<b>x</b>	<b>x</b>
12. <b>“felt ashamed of myself”*</b>	<b>x</b>	<b>x</b>
13. <b>“felt guilty about something I said or did”</b>	<b>x</b>	<b>x</b>
14. “acted in a way I felt was right”	-	-
15. <b>“kept thinking how I wish I acted differently”</b>	<b>x</b>	<b>x</b>
16. <b>“regretted how I acted”</b>	<b>x</b>	<b>x</b>
17. <b>“found it difficult to accept myself”*</b>	<b>x</b>	<b>x</b>
18. <b>“felt like a failure”</b>	<b>x</b>	<b>x</b>
19. <b>“felt like there was nothing I could do to make things right”*</b>	<b>x</b>	<b>x</b>
20. <b>“wished that I had acted differently”</b>	<b>x</b>	<b>x</b>

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*Note:* x - item was retained from Subsample Analysis; **Bolded** items were retained from the EFA analysis; \* - item was removed to reduce redundancy.

## **Vita**

Chelsea Marie Hughes is pursuing her doctoral degree in Psychology at Virginia Commonwealth University. She was born on September 9, 1991 in Covington, Louisiana, and is a citizen of the United States. She received her B.A. in Psychology from East Carolina University, graduating in three years, *Magna Cum Laude* from the inaugural class of the ECU Honors College. Immediately after graduation, Chelsea began her graduate career at VCU. In her doctoral program, she works under Dr. Everett Worthington and is an active member of the Positive Psychology Research Group. Chelsea's own research focuses on communication, particularly social interaction in online gaming. She received her M.S. in Counseling Psychology from Virginia Commonwealth University in 2015.