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The role of athletic identity and sport motivation in collegiate eSport burnout

William Russell

Missouri Western State University

College eSports have rapidly grown, yet research on psychological aspects of eSports is lacking, resulting in calls for greater understanding in this area. In traditional sports, athletic identity and sport motivations have been linked to athlete burnout, and as collegiate eSports become more structured and eSport athletes' training becomes more intensive, their athletic identities and motivations may influence their burnout potential. While eSport athletes' identity and sport motivations have been studied separately, no research has examined their relationship with college eSport athlete burnout. Therefore, the purpose was to determine the extent to which participation frequency, athletic identity (AI), and eSport motivations predicted college eSport athletes' burnout. Collegiate eSport athletes (N = 98; M age = 20.55, SD = 2.33) were assessed on their self-reported eSport frequency, athletic identity, sport motivations, and burnout. Separate multiple regression analyses on burnout dimensions and global burnout showed that amotivation was a positive predictor of reduced sense of accomplishment, emotional/physical exhaustion, sport devaluation, and global burnout. In addition, athletic identity was a negative predictor of eSport athletes' sport devaluation. Results suggest that amotivation is a predictor of college eSport burnout and that athletic identity may buffer against burnout in eSport athletes.

The popularity of eSports has fueled its recent growth into a multi-billion dollar industry (Meng-Lewis et al., 2022). eSport participation has also grown, with worldwide players reaching 3.38 million in 2023, and a global games market reaching $184 billion (Newzoo, 2023). A corollary of this growth has been the spread of collegiate eSports programs in the United States (Buzzelli & Draper, 2021). For example, the National Association of College Esports (NACE), which began in 2016 with 42 participating universities, has grown to over 240 member schools, more than 5,000 student-athletes, and offers $16 million in eSports scholarships and aid (National Association of Collegiate Esports, n.d.).

eSports have evolved into fully developed sports activities in that they are increasingly organized, with training and formal competitive structures (Hallman & Giel, 2018; Jenny et al., 2017). They have also seen issues similar to traditional competitive sport frameworks such as performance anxiety (Smith et al., 2019), sport-related injuries (Clements et al., 2022), and burnout (Hong et al., 2023; Oja et al., 2018; Poulus et al., 2024). Their growth has also garnered interest in psychological factors in eSports, and scholars (e.g., Banyai et al., 2019; Hwang & Kim, 2023) have noted that further study in this area is needed. Among psychological factors studied within eSports have included mental toughness (Poulus et al., 2020), anxiety (Leis & Lautenbach, 2020), motivation (Hulaj et al., 2020; Oja et al., 2018), self-identity (Buzzelli & Draper, 2021; Schaeperkoetter et al., 2017), and more recently, burnout (Hong et al., 2023; Poulus et al., 2024).

In traditional sport, burnout has been widely studied (e.g., Eklund & Cresswell, 2007; Gustafsson et al., 2007), and linked to negative outcomes such as decreased motivation, lower performance, dropout, and poor mental health (Goodger et al., 2007; Gustafsson et al., 2014; Kamimura et al., 2020). Additionally, burnout is an issue among traditional college athletes (NCAA, 2014) and has been attributed to the increasingly intense nature of college athletics (Gould & Whitley, 2009).

Research has identified factors associated with athletic burnout including elevated stress (Gould et al., 1997) and intensive physical training (Kenttä & Hassmén, 1998; Kenttä et al., 2001). Yet, burnout is often driven by psychological factors other than physical overtraining, such as perfectionism (Appleton & Hill, 2012), social support (Gabana et al., 2017; Pacewicz et al., 2019), motivational climate (Smith et al., 2010), athletic identity (Black & Smith, 2007; Gustafsson et al., 2008) and less self-determined forms of motivation (Cresswell & Eklund, 2005a, 2005b; Holmberg & Sheridan, 2013). While burnout has been studied in eSports (e.g., Oja et al., 2018), the growth of collegiate eSport programs and purported similarities between college eSport athletes' and traditional athletes' experiences (Hong et al., 2023; Poulus et al., 2022) has prompted calls (Poulus et al., 2024) for further study of burnout in college eSport athletes. Two particular factors that may be relevant to

eSport athletes' burnout are their athletic identity and less self-determined forms of motivation.

Athletic identity (AI), or the extent to which one identifies with the athlete role (Brewer et al., 1993) has been linked to greater athlete burnout (Gustafsson et al., 2007), yet eSport athletes' AI has yielded a more complex picture since their self-identities as athletes appear to be evolving (Schaeperkoetter et al. 2017; Stone, 2019). Additionally, the Self-Determination Theory (SDT) framework (Deci & Ryan, 1985) has become a popular approach to studying athlete burnout and has shown that self-determined forms of motivations are negatively related to burnout (Lemyre et al., 2008). Key SDT components (e.g., basic psychological needs, intrinsic motivation, extrinsic autonomous regulation, and amotivation) are all significant predictors of athlete burnout dimensions: reduced sense of accomplishment, physical and emotional exhaustion, and sport devaluation (Li et al., 2013). Qualitative research on eSport athletes' motivations and burnout has also used the SDT framework, noting that eSport athletes who were intrinsically motivated reported more burnout when motivations became more extrinsic or they were amotivated (Oja et al., 2018).

Yet while AI and sport motivations have been studied in eSports, research to date has not examined their combined relationship on burnout in collegiate eSport athletes. Therefore, the purpose of this study was to examine whether college eSport athletes' burnout could be predicted by their eSport frequency, AI, and sport motivations. Since traditional athletes may be prone to burnout due to excessive training (Gould et al., 1997; Gustafsson et al., 2008; Mouehli-Guizani et al., 2022), competitive demands, and long seasons (Raedeke & Smith, 2009), it was hypothesized that eSport participation frequency would be predictive of greater burnout. Since research has shown that burnout is linked to less self-determined forms of motivation (e.g., Holmberg & Sheridan, 2013; Raedeke & Smith, 2001), it was hypothesized that eSport athletes' amotivation and extrinsic motivations would be predictive of greater burnout. Finally, since research on AI and burnout in traditional athletes has yielded mixed findings regarding whether AI is positively or negatively related to burnout, there was no a priori hypothesis regarding this relationship.

Literature Review and Conceptual Frameworks

Burnout in eSports

Burnout within eSports is an emergent issue (e.g., Oja et al., 2018; Poulus et al., 2024), and has resulted in some eSport athletes experiencing mental health issues and dropping out. Extensively studied in traditional athletes (e.g., Eklund & Cresswell, 2007; Goodger et al., 2007; Gustafsson et al., 2007), burnout has been conceptualized as a cognitive-affective syndrome expressed by three inter-related components including (a) emotional and physical exhaustion, characterized by fatigue from sport demands; (b) a reduced sense of accomplishment, reflect-

ed by cynical appraisals of one's ability and performance; and (c) devaluation of sport, characterized by lowered interest or a negative attitude toward one's sport (Raedeke, 1997). Athletic burnout has been linked to negative outcomes such as lower motivation, reduced performance, dropout, and various mental health issues (Goodger et al., 2007; Gustafsson et al., 2014; Kamimura et al., 2020). Certain aspects of eSport training regimens mirror traditional athletes' experiences and could hasten burnout, including various competitive stressors (Poulus et al., 2022), voluminous training (Hong et al., 2023), and motivational depletion (Oja et al., 2018).

Yet unlike traditional sports with competitive and off-seasons, eSport athletes often compete year-round (Smith et al., 2022). Their lifestyles can also involve lengthy periods of gaming which can negatively influence well-being (Banyai et al., 2019) and poor sleep patterns, which are associated with deleterious physical and mental effects (Smith et al., 2022). In particular, eSport athletes often have poor sleep habits (Bonnar et al., 2019; Palanichamy et al., 2020) as well as long periods of training and competing (Lewis et al., 2011; Smith et al., 2022). Such findings mirror traditional athlete burnout research, suggesting that the sport-training factors most related to burnout are excessive training and inadequate recovery (Gustafsson et al., 2008).

Burnout research with eSport athletes has also reinforced work with traditional athletes in that extrinsic motivations may contribute to burnout, with some college eSport athletes perceiving that their scholarship increased their sense of burnout (Oja et al., 2018). Recently, Hong et al. (2023) examined intrinsic and extrinsic motivation on eSport athletes' burnout and found intrinsic motivation was negatively associated with burnout, particularly exhaustion and reduced sense of accomplishment. Moreover, research on predictors of negative mental health in eSport athletes found that reduced sense of accomplishment and exhaustion predicted their anxiety, depression, and psychological distress (Smith et al., 2022). Finally, Poulus et al. (2024) recently examined burnout, resilience, and coping among elite eSport athletes and found their reduced sense of accomplishment was negatively associated with their resilience. Hence, growing evidence suggests mental health concerns evident among eSport athletes, with burnout appearing to be a salient issue.

Athletic Identity and Burnout

Athletic identity (AI) is the extent to which one identifies with the athlete role (Brewer et al., 1993) and has been linked with both positive and negative athletic outcomes. A strong AI is associated with positive outcomes from intense training, such as greater sport commitment, better body image, self-confidence, and lower anxiety (Callero, 1985; Horton & Mack, 2000). However, a sole emphasis on one's athletic role may foster a unidimensional identity, which has been linked to negative athlete well-being (Coakley, 1992). One risk of a strong, exclusive AI is that the one's self-worth may become reliant on their performance (Gustafsson et al.,

2008) and may be vulnerable when one's performance does not meet their expectations (Brewer et al., 1993). Such a one-dimensional identity may incite heightened pressure to succeed, leading to athletic burnout (Coakley, 1992; Gustafsson et al., 2008; Lemyre et al., 2008). AI has predicted exhaustion and reduced sense of accomplishment in adolescent athletes (Martin & Horn, 2013), and burnout is greater in athletes with a strong, exclusive AI (Gustafsson et al., 2007).

Yet, research has also found AI to be negatively related to burnout. Black & Smith (2007) found that adolescent athletes with a more exclusive AI had lower reduced sense of accomplishment and sport devaluation, and noted that athletes with greater exclusive identities might reflect those who have experienced identity *achievement* rather than identity *foreclosure*. More recently, Martin et al. (2022) examined psychological and physiological predictors of burnout and found that a strong AI was negatively related to burnout, noting that AI was correlated with mental toughness.

AI has also been examined in eSport athletes, yielding a more intricate picture (Stone, 2019). For example, their eSport goals tend to be intrinsically motivated and separate from other self-identities, yet their AI has been shown to be secondary to other social self-identities (Buzzelli & Draper, 2021). Schaeperkoetter et al. (2017) also found that while college eSport athletes self-identified as athletes, they were rarely identified as athletes by those outside of the eSports community and felt a lack of acceptance from their athletics department. Recently, a "gamer identity" was found to be positively related to such factors as age, gaming behavioral intentions, time spent playing video games, and eSports team membership (Yim et al., 2023). Yet, while eSport athletes' identity has been studied, less is known about how their AI might influence negative outcomes such as burnout.

Motivation and Burnout

Burnout has been associated with less self-determined forms of motivation (Cresswell & Eklund, 2005a, 2005b; Holmberg & Sheridan, 2013). Self-Determination Theory (SDT; Deci & Ryan, 1985), which extends traditional views of intrinsic and extrinsic motivation and includes the psychological needs for competence, autonomy, and relatedness that drive motivated behavior, has been useful in examining motivation and burnout (e.g., Harris & Watson, 2014; Li et al. 2013; Lonsdale et al., 2009). Basic Needs Theory (a sub-theory of SDT) notes that individuals are motivated to satisfy the universal needs of autonomy (making volitional choices), competence (achieving desired outcomes), and relatedness (connectedness to others), and that these needs are foundational for behavioral self-regulation (Deci & Ryan, 1985; Ryan & Deci, 2000).

Also posited by SDT is that a continuum exists where different motivations can be identified. At one end of this continuum is amotivation, which entails a lack of intention as a result of not valuing an activity (Ryan & Deci, 2000) and is a motivational sign of burnout (Eklund & Cress-

well, 2007). The continuum ends with intrinsic motivation (where basic needs are met and behaviors are self-regulated) and contains various extrinsic motivations between these two opposite poles (Ryan & Deci, 2000). Specifically, several types of extrinsic motivation are proposed, including external (related to external pressures), introjected (internal pressures to avoid guilt), and identified (motivation associated with personal values) regulation. Finally, integrated regulation involves doing an activity because it aligns with one's values, even though the behavior is motivated by external factors (Ryan & Deci, 2000).

As one's motivations become more intrinsic, their behaviors become more autonomously regulated through satisfaction of autonomy, competence, and relatedness needs. With traditional athletes, research with the SDT framework has shown a negative relationship between burnout and intrinsic motivation (Holmberg & Sheridan, 2013; Raedeke & Smith, 2001), and a positive relationship between extrinsic motivation and burnout (Holmberg & Sheridan, 2013), as well as amotivation and burnout (Cresswell & Eklund, 2005a, 2005b; Li et al., 2013; Raedeke & Smith, 2001).

Motivation and eSport Burnout

The SDT framework has also been used to study eSport athletes. For example, use of SDT to examine video gaming motivations indicates that autonomy, competence, and relatedness independently predict enjoyment and persistence in "massively multiplayer online" (MMO) gaming contexts (Ryan et al., 2006). Also, SDT has explained video game performance, with competence and autonomy predicting enhanced performance (Hulaj et al., 2020). Research has also found collegiate eSport athletes are largely intrinsically motivated, yet these same athletes became burned out when their motivations became extrinsic or they became amotivated (Oja et al., 2018). Thus, as collegiate eSport athletes devote more time and effort to their skill development, their AI and motivations for competing in eSports may influence their burnout potential.

Method

Participants

Participants were 98 collegiate eSports athletes (86 males, 11 females, 1 did not say) aged 18-29 (M = 20.55, SD = 2.33) from nine colleges/universities across the United States (California, Indiana, Kansas, Michigan, Missouri, New Mexico, Texas, and Utah). The sample ethnicity was mainly Caucasian (n = 74, 75.5%), followed by African-American (n = 6, 6.1%), Asian (n = 6, 6.1%), and Hispanic (n = 6, 6.1%) backgrounds. The other participants (n = 6, 6.1%) did not specify an ethnicity. There were 24 first-year students, 29 sophomores, 20 juniors, 19 seniors, and six participants who reported an "other" category (e.g., graduate students). Participants were asked their scholarship status and 40 participants (40.8%) were on their varsity team with a partial scholarship, 36 participants (36.7%) were on their varsity team with no scholarship, nine partici-

pants (9.2%) were members of a university club team, six participants (6.1%) were on a varsity team with a full scholarship, three participants (3.1%) were on a junior varsity/developmental team, while four participants (4.1%) indicated their status as "other" (e.g., graduate assistant). For eSports frequency, one participant reported engaging in eSports only several times a month; five participants (5.1%) engaged in eSports once a week; six participants (6.1%) engaged in eSports once daily; 25 participants (26%) engaged in eSports daily (multiple times a day), and 61 participants (62%) engaged in eSports several times a week.

Procedures

After receiving university research ethics board approval, an internet search was performed for US colleges and universities that actively operated an eSports competitive program. Once programs were identified, an email was sent to their university research ethics board for permission/approval to contact their eSports coach/director about the project. Upon approval from their research ethics committees, an email was sent to these eSports coaches/directors explaining the nature of the project and requested their cooperation in forwarding a segment of the email directly soliciting participation of eSport athletes at their school, along with an electronic survey link, to their eSport athletes. The electronic survey (Google Forms) was structured so as to obtain participant consent via an initial survey item asking participants to click "yes" as to their agreement to participate (before beginning the survey instruments) and participants' names were omitted from the survey, thereby protecting their anonymity. Data were collected over a 12-month period. The measures described below were included in the electronic survey.

Instruments

Demographics. The initial section contained demographic items asking about the participant's age, university affiliation, gender, ethnicity, year in school, eSport participant status (varsity full-scholarship, varsity partial-scholarship, varsity no-scholarship, university club team, junior varsity/developmental team, or "other") and eSport participation frequency (daily-multiple times a day, daily-once a day, several times per week, once a week, several times per month, less than monthly).

Athletic Identity. The Athletic Identity Measurement Scale – Third Generation (AIMS-3G; Brewer et al., 2022) assessed athletic identity. The AIMS-3G consists of three correlated but conceptually independent scales (a) a unidimensional *athletic identity* scale (4 items), (b) an athletic identity properties scale consisting of the subscales of *athletic identity salience* (5 items) and *self-worth contingency* (4 items), and (c) an athletic identity processes scale consisting of the subscales of *self-presentation* (4 items) and *social reinforcement* (4 items). The AIMS-3G has a 7-point (1=*strongly disagree* to 7= *strongly agree*) Likert-type scale, and higher scores represent stronger overall AI, AI properties, and AI processes. Sample items from the AIMS-3G include "I would describe myself as an athlete" (athletic self-identity), "I spend more time thinking about sport than anything

else" (athletic identity salience), "How I feel about myself depends a lot on how I perform as an athlete" (self-worth contingency), "It is important that I look like an athlete to others" (athletic self-presentation), and "I receive encouragement from others for participating in sport" (social reinforcement).

The AIMS-3G is recommended over the AIMS as it is an improved version of the original 10-item version (Brewer et al., 1993) and the revised 7-item version (Brewer & Cornelius, 2001), free of items that do not unambiguously reflect identification with the athlete role. Additionally, the AIMS-3G AI properties and processes subscales provide a more comprehensive view of AI over the original AIMS (Brewer et al., 2022). For this study, items were modified so the words "athlete" or "sport" were revised to "eSport athlete" or "eSport" (e.g., "I spend more time thinking about eSport than anything else"; "I would describe myself as an eSport athlete"). Acceptable internal consistency coefficients (α = .72 to .87) have been reported (Brewer et al., 2022) and AIMS-3G subscale alphas in the current study ranged from α = .72 to .90.

Sport Motivation. The Sport Motivation Scale-II (SMS-II; Pelletier et al., 2013) was used to assess eSport athletes' sport motivation. A revision of the Sport Motivation Scale (Pelletier et al., 1995), this scale is recommended over the original version, as it is more time efficient and theoretically aligned in item content. The SMS-II is theoretically based on Self-Determination Theory (SDT; Deci & Ryan, 2000) and assesses six types of motivation along the SDT motivational continuum; intrinsic regulation, integrated regulation, identified regulation, introjected regulation, external regulation, and amotivation. There are 18 items (six subscales of three items each) assessed on a seven-point (1 = *does not correspond at all* to 7 = *corresponds completely*) Likert scale. For the original SMS-II, items represent responses to the prompt "Why do you practice sports". For this study, the prompt was revised to "Why do you practice eSports?". Pelletier et al. (2013) reported adequate validity and reliability (.73 to .86) for the SMS-II and subscale alphas in the current study ranged from α =.60 to 87. It should be noted that values .60 or above are considered adequate for scales used in social sciences (Nunnally & Bernstein, 1994).

Athlete Burnout. The Athlete Burnout Questionnaire (ABQ; Raedeke & Smith, 2001) assessed burnout. The ABQ has 15 items, assessed on a five-point Likert-type scale (1 = *almost never* to 5 = *almost always*), with five items corresponding to the respective dimensions of emotional and physical exhaustion, reduced sense of accomplishment, and sport devaluation. Sample items include "I feel physically worn out from my sport." (physical/emotional exhaustion), "I am not performing up to my ability in my sport" (reduced sense of accomplishment), and "I don't care about my sport performance as much as I used to" (sport devaluation). Subscale scores on the ABQ were calculated by averaging subscale items, and a global burnout score was also calculated by averaging scores across all three subscales. For this study, ABQ items were revised so that "eSport" replaced the word "sport" (e.g., "I am not performing up

to my ability in my eSport"). The ABQ has shown good reliability in college athletes (DeFreese & Smith, 2013; Raedeke & Smith, 2001), and Cronbach's alpha for the ABQ in the current study was acceptable for emotional/physical exhaustion (α =.90), reduced sense of accomplishment (α =.79), and sport devaluation (α =.85).

Data Analysis

Data analyses were performed using SPSS (Version 29.0) for Windows. Descriptive statistics were computed for each of the dependent variables (ABQ subscales and global burnout) for the entire sample. Correlations were also performed among eSports frequency, AI properties and processes, sport motivations, and burnout dimensions. In order to examine whether eSports frequency, AI, or sport motivations were predictive of eSport athlete burnout, a series of four regression analyses were performed for each dependent variable (reduced sense of accomplishment, emotional/physical exhaustion, sport devaluation, and global burnout). The first regression analysis included demographic variables as predictors (age, year in school, team status, eSports frequency). The second regression analysis included AI properties and processes (AIMS-3G subscales) as predictors. The third regression analysis included sport motivation variables (SMS-II subscales) as predictors, Finally, the fourth regression analysis included all of the statistically significant variables from the three previous regression analyses. All regression analyses were performed using the "enter" method, which simultaneously included all predictor variables in the model. The a priori significance level for all analyses was set at the $p = .05$ level.

Results

In order to determine an overall sense of burnout for the sample, a frequency distribution indicated that the majority of eSport athletes (86.7%, 85.7%, 74.5%, and 80.6%) scored 3.00 or below (i.e., *almost never* to *sometimes*) on global burnout, emotional/physical exhaustion, reduced sense of accomplishment, and sport devaluation, respectively. Six eSport athletes (6.1%) scored greater than 3.00 on all burnout subscales, signifying higher burnout (Raedeke & Smith, 2009). This proportion of eSport athletes with elevated burnout levels was comparable to previous burnout research with traditional athletes (Black & Smith, 2007).

A series of multiple regressions were performed on athlete burnout dimensions (reduced sense of accomplishment, emotional/physical exhaustion, sport devaluation) and global burnout, using demographic variables, AI subscales, and sport motivation subscales as predictors. Table 1 presents correlations among these variables, and as is displayed in the table, eSport athletes' SMS non-regulation (herein referred to as amotivation) was positively associated with their reduced sense of accomplishment, exhaustion, and sport devaluation ($p<.01$). Summaries of the regression analyses for each burnout dimension and global burnout are shown in Table 2 through 5 (p values for all results represent two-tailed tests) and are described below.

Table 1.

Correlations among eSports frequency, athletic identity, sport motivation, and athletic burnout.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 eSports Freq.	--	.34**	.47**	.16	.17	.16	.33**	.40**	.30**	.26**	.09	-.16	.16	-.06	-.21*	-.18
2 Ath. Self Ident.		--	.64**	.39**	.62**	.42**	.45**	.73**	.53**	.48**	.18	-.24*	-.23*	.09	-.38**	-.20*
3 Ath. Ident. Sal.			--	.49**	.61**	.28*	.31**	.65**	.45**	.45**	.22*	.02	.01	.18	-.19	.01
4 Self Worth Con.				--	.46**	.20*	.32**	.51**	.34**	.54**	.17	.28**	.26**	.32**	.11	.28**
5 Ath. Self Pres.					--	.45**	.17	.54**	.43**	.45**	.35**	.05	-.01	.32**	-.11	.10
6 Soc. Reinforce.						--	.27**	.37**	.35**	.30**	.35**	-.24*	-.17	.10	-.25*	-.12
7 SMS Intr. Reg.							--	.43**	.51**	.36**	.10	-.24*	-.27**	-.07	-.23*	-.25*
8 SMS Integ. Reg.								--	.68**	.65**	.31**	-.08	-.11	.11	-.18	-.08
9 SMS Ident. Reg.									--	.49**	.17	-.15	-.23	.11	-.18	-.13
10 SMS Intro. Reg										--	.54**	.05	-.02	.24*	-.04	.08
11 SMS Ext. Reg.											--	.10	.11	.31**	.02	.20
12 SMS Non-Reg.												--	.74**	.56**	.72**	.82**
13 ABQ Red. Sen.													--	.37**	.56**	.78**
14 ABQ Exhaust.														--	.43**	.78**
15 ABQ Sp. Dev.															--	.82**
16 Global ABQ																--
M	5.50	18.53	16.34	18.11	10.91	18.44	17.91	10.04	14.43	10.87	7.33	7.36	2.62	2.10	2.22	2.30
SD	.97	5.79	6.97	5.05	5.07	5.27	2.98	4.08	4.76	4.27	4.32	4.37	.86	.95	.92	.71

NOTE: 1 = eSports frequency; 2 = Athletic Self-Identity; 3 = Athletic Identity Salience; 4 = Self-Worth Contingency; 5 = Athletic Self-Presentation; 6 = Social Reinforcement; 7 = Intrinsic Regulation; 8 = Integrated Regulation; 9 = Identified Regulation; 10 = Introjected Regulation; 11 = External Regulation; 12 = Non-Regulation; 13 = Reduced Sense of Accomplishment; 14 = Emotional/Physical Exhaustion; 15 = Sport Devaluation; 16 = Global Burnout. *p<.05, ** p<.01 (2-tailed).

Table 2

Multiple regression analysis results for burnout dimensions and global burnout – Demographic Variables

Criterion: Reduced Sense of Accomplishment

Predictor	B	SE B	β	t	p
Age	.03	.05	.09	.65	.52
Year in School	-.03	.10	-.04	-.28	.78
Status	.03	.08	.04	.33	.74
eSports frequency	-.14	.09	-.16	-1.54	.13

Criterion: Emotional/Physical Exhaustion

Predictor	B	SE B	β	t	p
Age	.02	.05	.05	.40	.69
Year in School	.16	.10	.21	1.59	.12
Status	-.19	.08	-.24	-2.40	.02*
eSports frequency	-.09	.10	-.09	-.92	-.36

Criterion: Sport Devaluation

Predictor	B	SE B	β	t	p
Age	-.02	.05	-.04	-.32	.75
Year in School	.02	.10	.03	.22	.83
Status	.15	.08	.19	1.89	.06†
eSports frequency	- .17	.10	-.18	-1.78	.08†

Criterion: Global Burnout

Predictor	B	SE B	β	t	p
Age	.02	.04	.06	.43	.67
Year in School	.05	.08	.09	.65	.52
Status	-.02	.06	-.03	-.27	.79
eSports frequency	-.14	.08	-.19	-1.82	.07†

† $p < .10$

* $p < .05$

Table 3

Multiple regression analysis results for burnout dimensions and global burnout – AI variables

Criterion: Reduced Sense of Accomplishment

Predictor	B	SE B	β	t	p
Athletic Self-Identity	-.64	.02	-.43	-3.24	.002**
Athletic Identity Salience	.01	.02	.08	.62	.54
Self-Worth Contingency	.06	.02	.37	3.43	.00***
Athletic Self-Presentation	.01	.02	.08	.63	.53
Social Reinforcement	-.02	.02	-.13	-1.19	.24

Criterion: Emotional/Physical Exhaustion

Predictor	B	SE B	β	t	p
Athletic Self-Identity	-.03	.02	-.19	-1.39	.17
Athletic Identity Salience	-.004	.02	-.03	-.21	.83
Self-Worth Contingency	.05	.02	.25	2.33	.03*
Athletic Self-Presentation	.07	.03	.35	2.51	.01*
Social Reinforcement	-.003	.02	-.02	-.16	.87

Criterion: Sport Devaluation

Predictor	B	SE B	β	t	p
Athletic Self-Identity	-.08	.02	-.49	-3.76	.00***
Athletic Identity Salience	-.01	.02	-.09	-.72	.47
Self-Worth Contingency	.05	.02	.29	2.77	.007**
Athletic Self-Presentation	.03	.02	.19	1.45	.15
Social Reinforcement	-.03	.02	-.16	-1.55	.13

Criterion: Global Burnout

Predictor	B	SE B	β	t	p
Athletic Self-Identity	-.06	.02	-.45	-3.43	.00***
Athletic Identity Salience	-.002	.01	-.02	-.15	.88
Self-Worth Contingency	.05	.02	.36	3.29	.001**
Athletic Self-Presentation	.04	.02	.28	2.11	.04*
Social Reinforcement	-.02	.01	-.12	-1.12	.27

* $p < .05$
** $p < .01$
*** $p < .001$

Table 4

Multiple regression analysis results for burnout dimensions and global burnout – Sport Motivation Variables

Criterion: Reduced Sense of Accomplishment

Predictor	B	SE B	β	t	p
Intrinsic Regulation	.01	.03	.02	.20	.84
Integrated Regulation	.02	.02	.07	.64	.52
Identified Regulation	-.03	.02	-.16	-1.55	.13
Introjected Regulation	-.01	.02	-.07	-.67	.50
External Regulation	.02	.02	.08	.94	.35
Amotivation	.14	.02	.73	9.86	.00***

Criterion: Emotional/Physical Exhaustion

Predictor	B	SE B	β	t	p
Intrinsic Regulation	-.01	.03	-.02	-.19	.85
Integrated Regulation	-.01	.03	-.03	-.26	.79
Identified Regulation	.03	.02	.17	1.39	.17
Introjected Regulation	.01	.03	.04	.30	.76
External Regulation	.05	.02	.22	2.29	.03*
Amotivation	.12	.02	.55	6.35	.00 ***

Criterion: Sport Devaluation

Predictor	B	SE B	β	t	p
Intrinsic Regulation	.01	.03	.04	.43	.67
Integrated Regulation	-.03	.03	-.14	-1.21	.23
Identified Regulation	.002	.02	.01	.10	.92
Introjected Regulation	-.001	.02	-.004	-.04	.97
External Regulation	-.002	.02	-.01	-.13	.89
Amotivation	.15	.02	.72	9.36	.00***

Criterion: Global Burnout

Predictor	B	SE B	β	t	p
Intrinsic Regulation	-.002	.02	-.01	-.14	.89
Integrated Regulation	-.01	.02	-.06	-.67	.50
Identified Regulation	-.001	.01	.005	.06	.95
Introjected Regulation	.001	.02	.007	.08	.94
External Regulation	.02	.01	.14	1.94	.06†
Amotivation	.13	.01	.80	12.77	.00 ***

† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

Table 5

Multiple regression analysis results for burnout dimensions and global burnout – Previous Significant Predictors

Criterion: Reduced Sense of Accomplishment

Predictor	B	SE B	β	t	p
Athletic Self-Identity	-.02	.01	-.11	-1.40	.17
Self-Worth Contingency	.02	.01	.11	1.40	.17
Amotivation	.14	.02	.68	8.80	.00***

Criterion: Emotional/Physical Exhaustion

Predictor	B	SE B	β	t	p
eSport Status	-.11	.07	-.14	-1.67	.10
Self-Worth Contingency	.01	.02	.05	.58	.56
Athletic Self-Presentation	.03	.02	.18	1.81	.08†
Amotivation	.11	.02	.52	6.40	.00***
External Regulation	.04	.02	.16	1.93	.06†

Criterion: Sport Devaluation

Predictor	B	SE B	β	t	p
Athletic Self-Identity	-.04	.01	-.24	-2.91	.004**
Self-Worth Contingency	.004	.02	.02	.25	.80
Amotivation	.14	.02	.65	8.45	.00***

Criterion: Global Burnout

Predictor	B	SE B	β	t	p
Athletic Self-Identity	-.01	.01	-.10	-1.16	.25
Self-Worth Contingency	.007	.01	.05	.70	.49
Athletic Self-Presentation	.01	.01	.10	1.24	.22
Amotivation	.13	.01	.78	11.54	.00***

† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

Demographic Variables and Burnout. The first regression analyses were conducted to examine the relationship between eSport athletes' age, year in school, team status, and eSports frequency on burnout dimensions and global burnout.

Reduced Sense of Accomplishment. The overall regression model was not significant, F (4,93) =.74, p = .57, indicating that none of the demographic predictors accounted for a significant proportion of the variance in reduced sense of accomplishment. The results suggested that only 3% (R^2 = .031) of the variability in reduced sense of accomplishment was explained by these demographic variables.

Emotional/Physical Exhaustion. The overall regression model was significant, F (4,93) = 2.85, p <.05, indicating that the demographic factors, taken together, accounted for a significant portion of the variance in exhaustion. The results indicated that 11% (R^2 =.109) of the variability in exhaustion was explained by the demographic variables. Examining the individual predictors, the analysis revealed that team status was the strongest predictor of exhaustion (β = -.24, p<.05). Age, year in school, and eSport frequency were not significant predictors in the model. This suggests that eSport athletes on scholarship were positively associated with greater exhaustion, while the other demographic variables did not contribute significantly to the variance in exhaustion.

Sport Devaluation. The overall regression model was not significant, F (4,93) = 1.99, p >.05, indicating that none of the demographic predictors accounted for a significant proportion in the variance of eSport athletes' sport devaluation. The results suggested that only 8% (R^2 =.079) of the variability in sport devaluation was explained by demographic variables.

Global Burnout. The overall regression model was not significant, F (4,93) =1.21, p =.31, indicating that none of the demographic predictors accounted for a significant proportion of the variance in global burnout. The results suggested that only 5% (R^2 =.049) of the variability in global burnout was explained by demographic variables.

AI and Athlete Burnout. The second set of regression analyses were conducted to examine the relationship between AI dimensions (AIMS-3G) on burnout dimensions and global burnout.

Reduced Sense of Accomplishment. The overall regression model was significant, F (5,92) =5.12, p<.001, indicating that AI predictors, taken together, accounted for a significant portion of the variance in reduced sense of accomplishment. The results indicated that 22% (R^2 =.218) of the variability in reduced sense of accomplishment was explained by AI predictors. Examining the individual predictors, the analysis revealed that self-worth contingency was the strongest predictor (β =.37, p<.001), followed by athletic self-identity (β =-.43, p<.01). None of the other AI predictors were significant (p>.05). This suggests that higher self-worth contingency and lower athletic self-identity were associated with greater reduced sense of accomplishment, while the other AI predictors did not contribute significantly to the variance in reduced sense of accomplishment.

Emotional/Physical Exhaustion. The overall regression model was significant, F (5,92) =3.63, p<.01, indicating that AI predictors, taken together, accounted for a significant portion of the variance in exhaustion. The results indicated that 17% (R^2 =.165) of the variance in exhaustion was explained by AI predictors. Examining the individual predictors, the analysis revealed that athletic self-presentation was the strongest predictor (β =.35, p<.05), followed by self-worth contingency (β =.25, p<.05). None of the other AI predictors were significant (p>.05). This suggests that greater athletic self-presentation and self-worth contingency were associated with greater exhaustion.

Sport Devaluation. The overall regression model was significant, F (5,92) =6.36, p<.001, indicating that AI predictors accounted for a significant portion of the variance in sport devaluation. The results indicated that 26% (R^2 =.257) of the variance in sport devaluation was explained by AI predictors. Examining the individual predictors, the analysis revealed that athletic self-identity was the strongest predictor (β =-.49, p<.001), followed by self-worth contingency (β =.29, p<.01). None of the other AI predictors were significant (p>.05). This suggests that lower athletic self-identity and higher self-worth contingency were associated with greater sport devaluation.

Global Burnout. The overall regression model was significant, F (5,92) =5.51, p<.001, indicating that AI predictors accounted for a significant portion of the variance in global burnout. The results indicated that 23% (R^2 =.23) of the variance in global burnout was explained by AI predictors. Examining the individual predictors, the analysis revealed that athletic self-identity was the strongest predictor (β =-.45, p<.001), followed by self-worth contingency (β =.36, p<.01) and athletic self-presentation (β =.28, p<.05). None of the other AI predictors were significant (p>.05). This suggests that lower athletic self-identity, higher athletic self-presentation, and higher self-worth contingency were associated with greater global burnout.

*eSport Motivations and Burnout.*The third set of regression analyses were conducted to examine the relationship between eSport motivation dimensions (SMS-II) on burnout dimensions and global burnout.

Reduced Sense of Accomplishment. The overall regression model was significant, F (6,91) =20.03, p<.001, indicating that sport motivation predictors, taken together, accounted for a significant proportion of the variance in reduced sense of accomplishment. The results indicated that 57% (R^2 =.569) of the variability in reduced sense of accomplishment was explained by sport motivation predictors. Examining the individual predictors, the analysis revealed that amotivation was the strongest predictor (β =.73, p<.001). None of the other sport motivation predictors were significant. This suggests that greater amotivation was associated with greater reduced sense of accomplishment.

Emotional/Physical Exhaustion. The overall regression model was significant, F (6,91) =10.14, p<.001, indicating that sport motivation predictors, taken together, accounted for a significant portion of the variance in exhaustion. The results indicated that 40% (R^2 =.401) of the vari-

ability in exhaustion was explained by sport motivation predictors. Examining the individual predictors, the analysis revealed that amotivation was the strongest predictor (β =.55, p<.001), followed by external regulation (β =.22, p<.05). None of the other sport motivation predictors were significant. This suggests that greater amotivation and external regulation were associated with greater exhaustion.

Sport Devaluation. The overall regression model was significant, F (6,91) =17.04, p<.001, indicating that sport motivation predictors, taken together, accounted for a significant portion of the variance in sport devaluation. The results indicated that 53% (R^2 =.529) of the variability in sport devaluation was explained by sport motivation predictors. Examining the individual predictors, the analysis revealed that amotivation was the strongest predictor (β =.72, p<.001). None of the other sport motivation predictors were significant. This suggests that greater amotivation was associated with greater sport devaluation.

Global Burnout. The overall regression model was significant, F (6,91) =33.45, p<.001, indicating that sport motivation predictors, taken together, accounted for a significant portion of the variance in global burnout. The results indicated that 69% (R^2 =.688) of the variability in global burnout was explained by sport motivation predictors. Examining the individual predictors, the analysis revealed that amotivation was the strongest predictor (β =.80, p<.001). None of the other predictors were significant. This suggests that greater amotivation was associated with greater global burnout.

Previous Regression Model Predictors and Burnout. The fourth set of regression analyses were conducted to examine all of the statistically significant predictors from the previous three series of regression analyses to examine their relationships on burnout dimensions and global burnout.

Reduced Sense of Accomplishment. The overall regression model was significant, F (3,94) =39.98, p<.001, indicating that athlete self-identity, self-worth contingency, and amotivation, taken together, accounted for a significant portion of the variance in reduced sense of accomplishment. The results indicated that 56% (R^2 =.561) of the variability in reduced sense of accomplishment was explained by these predictors. Examining the individual predictors, the analysis revealed that amotivation was the strongest predictor (β =.68, p<.001). None of the other predictors were significant. This suggests that greater amotivation was associated with greater reduced sense of accomplishment.

Emotional/Physical Exhaustion. The overall regression model was significant, F (5,92) =14.61, p<.001, indicating that eSport status, self-worth contingency, athletic self-presentation, amotivation, and external regulation, taken together, accounted for a significant portion of the variance in exhaustion. The results indicated that 44% (R^2 =.443) of the variability in exhaustion was explained by these predictors. Examining the individual predictors, the analysis revealed that amotivation was the strongest predictor (β =.52, p<.001). None of the other predictors were significant. This suggests that great-

er amotivation was associated with greater exhaustion.

Sport Devaluation. The overall regression model was significant, F (3,94) =40.02, p<.001, indicating that athletic self-identity, self-worth contingency, and amotivation, taken together, accounted for a significant portion of variance in sport devaluation. The results indicated that 56% (R^2 =.561) of the variability in sport devaluation was explained by these predictors. Examining the individual predictors, the analysis revealed that amotivation was the strongest predictor (β =.65, p<.001), followed by athletic self-identity (β =-.24, p<.01). Self-worth contingency was not a significant predictor in the model (p>.05). This suggests that greater amotivation and lower athletic self-identity were associated with greater sport devaluation.

Global Burnout. The overall regression model was significant, F (4,93) =49.24, p<.001, indicating that athletic self-identity, self-worth contingency, athletic self-presentation, and amotivation, taken together, accounted for a significant portion of the variance in global burnout. The results indicated that 68% (R^2 =.679) of the variability in global burnout was explained by these predictors. Examining the individual predictors, the analysis revealed that amotivation was the strongest predictor (β =.78, p<.001). None of the other predictors were significant. This suggests that amotivation was associated with greater global burnout.

Discussion

The purpose of this study was to examine whether college eSport athletes' burnout could be predicted by their eSport participation frequency, AI, and eSport motivations. While eSport frequency did not predict burnout, amotivation predicted all burnout dimensions, as well as global burnout. Furthermore, the amount of variance explained by amotivation across burnout dimensions ranged from moderate to substantial. Thus, the finding that eSports athletes' amotivation was a significant predictor of burnout supports previous burnout research using the SDT framework with traditional athletes (Cresswell & Eklund 2005a, 2005b; Gould et al., 1996; Raedeke, 1997; Raedeke & Smith, 2001), and also that amotivation is a key motivational sign of athlete burnout (Eklund & Cresswell, 2007). This finding also extends support (e.g., Oja et al., 2018) for the SDT framework in predicting burnout from eSport athletes' less self-determined forms of motivation. For example, Oja et al. qualitatively examined collegiate eSport athletes' motivations and found that amotivation was a prominent theme with negative implications for collegiate eSports. The positive correlations in the current study between amotivation and reduced sense of accomplishment (r =.74, p < .001), emotional/physical exhaustion (r =.56, p < .001), and sport devaluation (r =.72, p < .001) were comparable to, or exceeded those from Raedeke and Smith (2001) who found positive correlations from .31 to .64 between amotivation and these burnout dimensions in traditional athletes. Since amotivation typically stems from thwarting of basic need satisfaction, or one's belief that efforts

will not yield desired sport outcomes, this result is logical. Yet, based on current findings, college eSport coaches should be aware of burnout symptoms and recognize signs of amotivated athletes, such as lacking reasons for continuing or perceptions that they are incapable of success in eSports.

There was also limited support for extrinsic motivation as a predictor of burnout, supporting previous research with traditional athletes demonstrating a link between extrinsic motivation and burnout (e.g., Holmberg & Sheridan, 2013). This finding is more tenuous since there was only a trend toward significance, and only for the emotional/physical exhaustion dimension, yet does suggest that extrinsic motivation may result in sensations of burnout in eSport athletes. While speculative, lack of stronger support for this relationship may have been due to the fact that less than half of the participants were on any form of eSport scholarship which, as has been previously noted (Oja et al., 2018), may have been perceived as an external pressure controlling their eSport involvement.

In regards to AI and eSport burnout, AI was a significant negative predictor of sport devaluation ($p < .01$, See Table 5), supporting previous research with traditional athletes, which has found AI to be negatively linked to burnout (Black & Smith, 2007; Martin et al., 2022; Raedeke, 1997). Traditional athletes with a strong AI enjoy their sport involvement and are invested in their sport (Brewer et al., 1993), and the current finding on AI and sport devaluation provides support that this may also be the case with collegiate eSport athletes. This also presents an interesting extension from traditional athletes to eSport athletes. Specifically, Black & Smith (2007) found swimmers with a more exclusive AI had lower reduced accomplishment and sport devaluation, and noted that athlete burnout may be dependent on the developmental phase of burnout the athlete experiences. Since sport devaluation may develop later in the course of burnout (Maslach et al., 2001), athletes farther along in their burnout may psychologically withdraw from their sport, such that it is less central to their identity. Such a similar developmental course may have occurred with these eSport athletes, reflected by this negative relationship.

An additional consideration regarding AI and burnout should also be noted. Raedeke & Smith (2009) indicated that a clearer understanding of burnout may be limited from cross-sectional designs, which do not explain how burnout evolves. This is relevant to AI and burnout, as cross sectional designs may not explain how athletes *develop* their identity and the potentially dynamic nature of this relationship. For example, eSport athletes might develop a strong AI over time, yet may experience a weakened AI with the onset of burnout, evidenced by a negative relationship between AI and sport devaluation. Therefore, since the AI of eSport athletes is evolving (Schaeperkoetter et al., 2017; Stone, 2019), future research should use longitudinal designs to more directly examine how college eSport athletes' AI *development* may relate to the potential evolution of burnout.

There was also a trend toward significance for AI self-presentation to be predictive of the exhaustion component of burnout (Table 5). While speculative, the continual effort devoted to the process of self-presentation to others as an eSport athlete may have contributed to a sense of emotional/physical exhaustion evident in that burnout subscale. Research has noted college eSport athletes defend their identities as athletes, but are rarely recognized as athletes beyond the eSports community (Schaeperkoetter et al., 2017). Since there are both private and public AI dimensions (Webb et al., 1998), and the self-presentation subscale of the AIMS-3G has been shown to be most associated with public AI (Brewer et al., 2022), there may be a physically and mentally fatiguing component of continual self-presentational efforts that some eSport athletes may experience in order to demonstrate to others that they are athletes.

Limitations and Future Research

The current results should be interpreted in light of several limitations that also highlight areas for further study. First, since the sample was small (N = 98) and burnout prevalence is thought to be low in college athletes (Gould & Dieffenbach, 2002; Raedeke & Smith, 2009), larger samples are needed to more rigorously examine the extent to which AI and sport motivations are predictive of eSport athletes' burnout. Second, the design was cross-sectional, so no causal inferences can be concluded from the findings for AI, eSport motivations, and burnout. Third, less than half (47%) of participants were on any form of scholarship. As previously noted, research on college eSport athletes' motivations and burnout (Oja et al., 2018) found some athletes perceived their scholarship was a factor influencing their burnout. Thus, variations among current eSport athletes' motivations and burnout perceptions may have been due to whether or not they were on an eSport scholarship. Fourth, a noted limitation of sport burnout research is a "floor effect" (Gustafsson et al., 2011), where burnout has been studied in athletes who are relatively lower in their burnout levels and athletes with greater burnout may have already dropped out. A similar effect may have occurred in this study, given that only about 6% of eSport athletes scored greater than 3.00 on all burnout subscales, signifying greater burnout (Raedeke & Smith, 2009). Thus, more longitudinal research designs examining eSport burnout are needed to clarify how such factors may evolve over time in predicting burnout.

Additionally, while self-reported eSport frequency was not predictive of burnout, the nature of the survey item about eSport frequency may have lacked precise information on eSport athletes' participation habits. Specifically, participants were asked only about their eSport participation *frequency* and not about *volume* or *duration* of activity each time they played. This is notable because Gustafsson et al. (2008) found excessive training and insufficient recovery were training-related problems that contributed to traditional athletes' burnout, while Mouelhi-Guizani et al. (2022) found that athletes who had high weekly training volumes

reported greater burnout. Thus, asking more specific information, such as average weekly time playing eSports (in hours) may have yielded more insightful information on participation habits and even AI, as game play duration and frequency have been shown to influence "gamer" identity development (Stone, 2019). Relatedly, not all eSports-regimen activities may be similar on their potential for burnout. For example, such activities may include practice sessions, watching recorded competitions, aim training (for first-person shooter [FPS] games), scrimmaging, pre-competition meetings, and actual competitions. Simply asking eSport athletes about their eSport frequency may not provide sufficient information as to the specific types of activities engaged in as part of their regular regimen, which could yield information regarding their potential for the development of burnout. Finally, participants were not asked *which* eSport game (or genre) was their primary game they played. This could have influenced their AI, such that athletes who compete in team-based Multiplayer Online Battle Arena (MOBA) games (e.g., League of Legends), may have a stronger social AI than single-player (FPS) games.

Conclusion

These limitations being acknowledged, the current findings contribute to the existing literature on burnout in eSports. First, these findings extend previous research using the SDT framework (e.g., Cresswell & Eklund, 2005a, 2005b; Raedeke & Smith, 2001) to examine the relationship between various forms of motivation and sport burnout, supporting that amotivation is predictive of all burnout dimensions and global burnout in collegiate eSport athletes. A practical implication of this finding is that college eSport coaches should monitor their athletes' motivations and ensure they are using an autonomy-supportive coaching style, which has not only been shown to less likely lead to athlete burnout (Isoard-Gautheur et al., 2013) but also enhance athletes' sense of competence and intrinsic motivation (Ntoumanis & Mallett, 2014). Second, current findings provide some support that overall AI may be negatively related to burnout (Black & Smith, 2007; Martin et al., 2022). This conclusion is more tenuous, since AI was a negative predictor of sport devaluation, but not reduced sense of accomplishment or emotional/physical exhaustion.

Yet, since research on psychological aspects of eSports is still growing and eSport athletes' identities are evolving (Stone, 2019), future research should examine how eSport athletes' identities develop, and whether a temporal relationship exists between AI and burnout. For example, since eSport athletes have been shown to be intrinsically motivated yet have an AI that is relatively less salient than other identities (Buzzelli & Draper, 2021), such a combination may account for a negative relationship between AI and burnout. Future research should examine AI and collegiate eSport burnout using larger samples, focusing on scholarship eSport athletes, and using longitudinal designs so that a more exhaustive picture may be obtained of how eSport athletes' identity development and burnout may be related.

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