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Match-Fixing in Esports: A Scoping Review of Skin-Betting

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Abstract: Match-fixing threatens the integrity of sport, violating the unpredictability of outcome from which sport derives its special value. This threat harms the economic product of sport as well, posing a threat to the sustainability of the sport leagues around the world. Discovering match-fixing in esports involves different challenges compared to traditional sports, such as the anonymity inherent to "skin-betting". This scoping review identifies a gap in the literature related to match-fixing in esports through skin-betting, and it moves the conversation towards a recognition of potential criminal exploitation of esports. The presented evaluation of esports match-fixing occurs under the lens of routine activities theory and drift theory. These theories suggest that the risk of criminal exploitation in esports is embedded in the anonymity skin-betting provides in virtual spaces for potential offenders. Esports thus faces a different risk of match-fixing compared to traditional sports that the esports industry is unprepared to address. Potential solutions are presented to complete the discussion and establish a foundation for future academic discourse of the topic at hand.

Keywords: Esports, Match-Fixing, Skins, Skin-betting, Anonymity, Cryptocurrency.

Introduction

In 2014, the Council of Europe broadly defined manipulation of sports competition, or match-fixing, as "an intentional arrangement, act, or omission aimed at an improper alteration of the result of the course of a sports competition in order to remove all or part of the unpredictable nature of the aforementioned sports competition with a view to obtaining an undue advantage for oneself or for others" (Van Der Hoeven et al., 2019: 2). The practice of match-fixing involves the distortion of the entire outcome (or a specific aspect of the outcome) of a contest. The manipulation of these sporting events intentionally and improperly controls the sporting situation for private gain. This gain may include a financial reward or securing some form of sporting advantage, such as relegation of a rival team. Match-fixing in the pursuit of such gain is often classified as a criminal act, as it may violate civil and criminal legal codes relating to fraud, bribery, money laundering, and corruption (Preston & Szymanski, 2003; Moriconi, 2016). Countries generally classify match-fixing as a criminal offence in four different ways: as a specified criminal offence; the criminal offence of fraud; the criminal offence of bribery; or the criminal offence of illegal or irregular gambling (Chappelet, 2015; Huggins, 2018). The United States does not outlaw match-fixing, but the 1964 United States Sports Bribery Act (SBA) attempted to provide the federal government with the legal power to combat bribing in sport contests (Holden & Rodenberg, 2015). Other countries, like Australia and Bulgaria, have specific match-fixing laws that carry prison sentences up to ten years and six years respectively (Carpenter, 2012).

This article focuses on match-fixing in esports. Esports match-fixers profit from the prevalence and popularity of unregulated gambling (Kulkarni, 2016). Unregulated gambling in esports is evidenced most notably by the practice known as "skin-betting" (Holden & Ehrlich, 2017; Martinelli, 2017; Macey et al., 2020; Zanescu et al., 2021). Skin-betting presents challenges to esports integrity that are different from challenges faced by traditional sports. Skins are in-game cosmetic items which change the appearance of a character, weapon, or tool. Skins are typically won during gameplay or can be purchased with traditional currencies (Martinelli, 2017; Greer et al., 2019). These skins are accessed via the accounts of online gaming platforms, such as *Steam*, and then they can be gambled on third-party unregulated sites, and through this process the skin becomes a form of digital currency. For example, those watching a live stream of an esports competition can place the skins they own as a wager via their player account. Winning a wager leads to acquisition of more skins, which can then be cashed out for traditional currency on website such as *OPSkins* (Holden & Ehrlich, 2017). This process allows gamblers to bypass betting restrictions on age, location, and wager-limit (Holden & Ehrlich, 2017; Martinelli, 2017). Skin-betting also costs less than legal gambling because the online transaction of skin-to-currency operates outside of any government regulation, which eliminates exchange rates and fees.

The work here describes the connection between esports skin-betting and the crime of match-fixing, discusses how the anonymity of esports tempts organized criminal involvement, and places esports match-fixing firmly in the criminal justice discourse. The scoping review presented in this paper reveals that skin-betting is an issue in esports, although the academic discourse thus far focuses instead on disagreements about the material value of skins as a digital currency in respect to the legal landscape. This current focus of skin-betting literature leaves a gap in relation to how skin-betting is related to match-fixing in esports. The literature critically fails to acknowledge the aspects of skin-betting related to crime and thereby does not consider the likelihood of organized criminal involvement in esports through match-fixing with skin-betting. The discussion in this paper focuses firstly on the anonymity skin-betting in esports provides, through the lens of drift theory (Matza, 1964). This anonymity reduces the costs of crime for interested parties. According to the established model of routine activities theory (Cohen & Felson, 1979) reduced costs and high rewards in esports match-fixing via skin-betting incentivizes criminal behavior from motivated offenders when combined with the suitable targets and weak guardianship that exists in esports. Organized criminal involvement in esports match-fixing is considered in detail, particularly in comparison to match-fixing in traditional sports. Finally, this article considers solutions to the problem and identifies the importance of raising awareness on the connection between esports match-fixing, skin-betting, and organized criminal involvement.

Literature Review
Traditional Sports

For most of history, sport and wider society distanced themselves from gambling due to both its addictive nature and the risks of corruption. Gambling clashed with the amateur ideologies of sports in the 1850s, which included the encouragement of health and moral character (Huggins, 2018). Betting in the late 1800s occurred near the physical sites of the event: the wagers consisted of modest sums and were typically limited to the overall outcome of a contest (Sharpe, 1997). As sport betting rose in popularity, officials became concerned that it undermined public confidence in the integrity of sports, promoted gambling amongst youth, and shifted the focus of fans away from the contest to the monetary stakes in the game (Preston & Szymanski, 2003; Tak, et al., 2018; Huggins, 2018). The DSM-5 classified gambling addiction as a psychological disorder in 2013 due to the impact on individuals' mental and physical health (Jones, et al., 2019). Laws related to sports betting reflected these concerns. The United States Congress passed The Professional and Amateur Sports Protection Act (PAPSA) in 1992, which stated that sport betting reduces public confidence in the authenticity of sport, and that endorsing sports betting would harm America's youth (Sönmez & Varol, 2018).

The modern landscape of gambling has changed dramatically. Betting became legitimized and socially accepted by governing bodies worldwide near the turn of the 21st century, resulting in laws that struck down or loosened pre-existing prohibitions on gambling (Huggins, 2018; Miller & Michelson, 2012; Tak, 2017; Tak, et al., 2018; Banks, 2017). For example, the USA Supreme Court overturned PAPSA in 2018 in Murphy *vs. NCAAA*, allowing states to offer sports betting (Brnovich, 2017). Additionally, gambling is viewed as a legitimate and profitable source of taxation income. Global gaming revenues rising to an estimated 423 billion USD in 2014 (Morgan Stanley, 2015) is a temptation for local governments to increase their share by promoting the product. These changes expanded the sport betting market globally. Sports betting in the USA and many other countries is now hugely popular, with transactions conducted across a variety of platforms on a variety of sports (De Sanctis, 2014). Amateur values that defined sport in the 1800s dissolved as sport transformed into a lucrative professional business in the middle of the 20th century, resulting in enormous increases in the liquidity of the sport betting market (Holden & Rodenberg, 2017; Serby, 2012). The casual supporter found that gambling added excitement to their sporting experience, regardless of any partisan interest in the outcome of the match (Jones, et al., 2019; Forrest & Simmons, 2003). Sport and betting operators enjoy a symbiotic lucrative partnership, which explains why the betting industry dominates the sponsorship scene of many sports (Banks, 2017). The modern sport experience now involves constant exposure to betting advertisements on equipment, uniforms, billboards, and commercials.

Technology pushed the growth of sport betting to new heights through online betting markets (Vamplew, 2018; Serby, 2012; Costa, 2018; Dietl & Weingartner, 2014; Forrest, 2013; Moriconi & Almeida, 2018; Spapens & Olfers, 2015). Technological changes in combination with the legalization and acceptance of sports betting around the world increased online gambling and bookmaking (Ward, 2019). Odds improved and prices lowered, international broadcasts delivered sports to a global audience, and the internet provided easy access to sporting contests worldwide. The product of sports betting began to adjust to the increase in demand. A wider variety of betting options became available, which allowed the size of the market to continue increasing exponentially (Forrest, 2017). Gamblers can bet on almost any element of a contest, bets can be placed before and during the event, and bets can be spread across multiple contests at the same time or over a period of time. Estimates for the value of the sport betting market in 2024 stands at around $155 billion USD, with approximately 61% of all the online gambling revenue coming from sport betting (*Gitnux,* 2023)

These changes in the sport betting market impacted betting-related match-fixing. This type of match-fixing occurs with the aim of material gain through the sport betting markets (Huggins, 2018; Masters, 2015; Triviño, 2018; Andreff, 2018), which is often initiated by organized crime (Holden, 2019; Forrest, 2017). These criminal organizations supply illegal gambling

and infiltrate the legal gambling markets to generate revenue and launder money (Banks, 2017). The ease of placing bets through online betting platforms makes national borders irrelevant for the criminal fixer. As a further complication, derivative and side-bets relating to an element of the contest beyond the final result have become hugely popular, which expanded options for fixers to manipulate events. Betting-related match-fixing usually involves wagering on the overall outcome because those bets are more lucrative, but manipulating a specific moment or action in a match is common. These manipulations are known as "spot fixes", which involve deliberate manipulations of player actions/statistics at specific points of the game that do not necessarily impact the result of the contest (Huggins, 2018; Masters, 2015). Manipulating the quantity of yellow cards in football (i.e., official sanctioning of players while the competition is in play), when goals are scored, or when substitutions are made, are all examples of spot-fixing. Spot-fixing is incredibly difficult to detect and is also easier for players to rationalize because the incidents manipulated do not necessarily impact the result (Huggins, 2018).

Esports

Match-fixing now extends beyond "traditional" sports into the esports field. For the purposes of discussion, "traditional sports" will be considered sports such as football, tennis, soccer, and the like; "esports" will refer to the cornucopia of online competitive videogames. Concerns exist related to esports match-fixing because of the harms observed in match-fixing of traditional sports (Ricci et al., 2016; Holden & Rodenberg, 2016). Match-fixing in traditional sport resulted in fans and sponsors abandoning football leagues in Malaysia and Vietnam (Hill, 2010), as well as volleyball leagues across Asia (Forrest, 2017), leading to the eventual collapse of these leagues. A similar outcome has already occurred in esports. A series of betting-related match-fixing scandals resulted in the Korean Esports Association (KeSPA) shutting down its long-running *StarCraft* ProLeague in 2016 (Ashcraft, 2016).

The empirical literature suggests this outcome is unsurprising. Freitas, Contreras-Espinosa, and Correia (2021) showed that match-fixing has a negative impact on sponsorship and fan viewership. Most participants surveyed in their study disliked brands which both sponsored esports players and also had some connection to illegal gambling and match-fixing. Sponsors contribute approximately 74% of esports revenues (Lokhman et al., 2018). Loss of sponsors coincides with a loss of fans, as match-fixing incidents become more regular, and viewers can no longer trust the outcome of esports competition. Trent and Shafer (2020) found that fans will retreat from esports that are connected to match-fixing, based on the dispositional theory of sports spectatorship. This theory maintains that the value of sport and enjoyment derives from unpredictability of outcome inherent to sport, where enjoyment comes from watching competitors face off in a suspenseful encounter (Trent & Shafer, 2020). The authors argued that

interest and enjoyment from the fans will decline given match-fixing damages the belief in uncertainty of outcome.

Esports match-fixing offers opportunity for illicit gain because of the size of the betting market. Increased esports popularity is reflected in the revenue generated by the esports betting market, with an estimated 7.4 billion USD in 2016 (Shabir, 2017), 9.7 billion in 2021, and expectations of 24 million in 2028 (*Business Research Insights,* 2023). Estimates differ, but there seems to be a consensus amongst most analysts that the size of the market is steadily, or even exponentially, increasing (Lokhman et al., 2018; *SuperData,* 2017; *Newzoo*, 2021). Even though legal sports bets in esports often have small limits and limited options, individuals can use unregulated and offshore betting sites with more options and higher limits (Shabir, 2017). Subsequently, *League of Legends, Overwatch,* and most notably *Counter-Strike* all experienced match-fixing scandals in the last decade (Holden, 2019; Holden, 2021; Abarbanel & Johnson, 2019; Petchesky, 2010; Kulkarni, 2016). In 2010 a top *Starcraft* player allegedly threw multiple matches at the request of gamblers (Petchesky, 2010). Another esports match-fixing scandal occurred in Australia in 2019, also involving *Counter-Strike*, when police arrested six people and charged them with match-fixing related offences. Law enforcement accused the players of arranging to lose matches and placing bets on those manipulated matches. (Holden, 2019). More recently, the FBI continues to investigate possible manipulation related to *Counter-Strike* in North America (Holden, 2021). Successful prosecution of incidents rarely follows discovery of these events because the criminal codes, betting statutes, or bribery statutes often do not apply in esports cases (Holden & Ehrlich, 2017; Lu, 2022), which limits the deterrent impact of esports regulations (Lu, 2022).

Methods

This article presents a scoping review of the existing academic and grey literature pertaining to match-fixing in esports and, particularly, use of skin-betting as an unregulated mode of gambling on esports contests. The objective of this review is to provide a critical evaluation of the research in this area or, as Munn and colleagues describe it, construct a "map of the evidence" (2018: 143). This process can not only assist in the identification of what the key issues are for practitioners and academics, but also identifies gaps in the current literature base which need to be addressed to implement more effective intervention and prevention strategies. Predetermined search terms were selected by the authors with the aim to capture the broadest cross-section of literature possible in relation to esports match-fixing and skin-betting; the decision to keep search terms broad was based on preliminary research indicating that there is not an onerous amount of material that already exists on this subject matter and, as such, it was presumed that broader search terms would be required to ensure that all material available was included. In all, a total of 46 search term combinations were used across seven academic databases (SAGE,

PhilPapers, JSTOR, Web of Science, The Directory of Open Access Journals, Science Direct, and Wiley Online Library). These search engines were selected rather than more subject-specific databases based on the potential they provide for inter-disciplinary research which, given that esports gambling and corruption transcends several traditional academic foci, was deemed most appropriate (Lehnen & Insua, 2022).

Search terms used for this review included various combinations of key words identified as relevant such as "esports"; "match-fixing"; "skin-betting"; "skin-wager"; "skin-gambling", and; "esports cryptocurrency." Due to the limited amount of material on the topic, a secondary snowball phase took place wherein reference lists of the academic articles identified in initial searches were used to identify additional material, including relevant grey literature like news articles, legislation, and technical reports (Jalali & Wohlin, 2012). Due to the researchers' language capabilities, material not published in English was not included in this scoping review and was excluded for consideration. After eliminating non-English sources, a total of 53 items (academic and grey literature) were included in the scoping review. After evaluating this material, further material was sourced as needed to provide context for the discussion points to follow; for example, with the literature indicating issues around anonymity in skin-betting, a tertiary research process occurred which specifically targeted theories on how anonymity impacts online behaviors from a cyber-psychological perspective. While this material is technically not part of the scoping review, it nevertheless adds much needed theoretical framing to the debates raised in this article.

Discussion

The following places the issue of esports match-fixing through skin-betting in context, to show that the risk of this crime is high enough to warrant critical attention from relevant stakeholders. The discussion introduces the concept of anonymity in esports and then identifies, through drift theory (Matza, 1964), how anonymity inherent to skin-betting increases criminal risk of match-fixing by reducing costs related to likelihood of discovery. These low costs and high rewards of match-fixing through skin-betting are criminogenic according to routine activities theory (Cohen & Felson 1979). This evaluation of the problem suggests esports is an enticing environment for organized criminal networks seeking ideal match-fixing scenarios. Potential solutions are evaluated that could work towards addressing the crime and reducing risk of esports manipulations through skin-betting.

Anonymity

Anonymity can be understood as remaining unknown, without identification, or without the revelation of the name (Nissenbaum, 1999). On the internet, this can include engaging in online activity using virtual identities that cannot be traced to a physical identity, recognized as a critical

issue for internet crime (Armstrong & Forde, 2003). Anonymity contributes to an online disinhibition effect, as identified by a variety of researchers (Suler, 2004; Joinson, 1998; Joinson, 2001; Leung, 2002), wherein individuals will behave more openly and without as much concern for social norm when behind a virtual "screen". According to Suler (2004), this occurs in part because virtual space allows for a dissociation between the person's sense of self and the engagement of behavior online. Online offenders compartmentalize their identity in such a way that they perceive their own actions in the virtual space as not governed by the rules of the real world (Finch, 2002 pers comm., in Suler, 2004). Further studies in deindividuation theory suggest that anonymity drives deviant behavior due to the experience of losing one's sense of self online (Festinger et al., 1952; Diener et al., 1980; Zimbardo, 1969). It is suggested that restraining and deterring deviant behavior is more difficult when the offender cannot be identified. Therefore, factors that prevent identity from being disclosed, those that protect anonymity, are attractive to criminals.

The literature seems to suggest that there are two important factors at work related to the anonymity of the virtual world and criminal activity. Firstly, the virtual world lowers inhibitions, which provides a space for virtual criminals who may not commit crime in the real world. This process involves actors distinguishing online actions from the same actions taking place outside the virtual space. Drift theory (Matza, 1964: 28) explains that criminal events occur as transitory behaviors, wherein young people float in-and-out of crime based on the situation. This theory is relevant to esports because the average age for esports players is relatively young compared to traditional sports (Lee, 2022), particularly for some of the most popular online battle games (Hedlund, 2021), and esports athletes retire at a younger age compared to their traditional sport counterparts (Suncho, 2023). For example, popular games such as *Call of Duty* and *Overwatch* have an average age in the low 20s (Lee, 2022). Jovanovic (2023) similarly shows that a quarter of all gamers in the USA are under 18. Youth esports is on the rise, evidenced by the rapid growth of esports high school and college teams across the country (Hennick, 2019) Digital drift, as explained by Goldsmith and Brewer (2015), applies this theory to the online space where offenders shift between their virtual and real identity, made possible due to the anonymity and dissociation that the virtual space offers. Arguably more problematic, the virtual world also is an ideal, practical space for individuals already committing crimes in the real world. Anonymity granted by virtual spaces inhibits attempts at identifying an offender online who may otherwise face more risk of exposure committing crime in the real world. Experienced offenders, like those that form organized criminal networks implicated in match-fixing, could exploit these conditions and, rather than drifting in-and-out of deviant behavior, instead use the virtual space as a vehicle to commit the same crimes with less risk of discovery.

Anonymity explains the high risk of match-fixing already well-established in traditional sports (Forrest, 2017; Dietl & Weingartner, 2014;

Szymanski, 2003; Maennig, 2002). Players, referees, and other sport actors directly involved in match-fixing may struggle to remain anonymous because they are committing observable actions; however, the criminals that manipulate the matches behind the scenes can take measures to protect their identities. Third-party "runners" can be sent to organize fixes directly (Hill, 2010), and other third parties can place bets online from almost anywhere in the world, in semi-legal and legal markets. The organized criminal network is far removed from the manipulation itself and the bets placed on the fix. Attempts to discover criminal networks responsible for organizing sports manipulation therefore lie beyond the resources and jurisdiction of sport governing bodies and, can often be a futile effort for local, non-specialized law enforcement. As a result, there exists an over-reliance on discovering match-fixing incidents through crawler-software that monitors betting markets (McHale, 2018). When suspicious movements in the odds are detected with crawler-software, the match is flagged and investigated. If an account is attached to the placement of suspect bets, this can then be tracked. However, this method is severely limited and unable to discover all incidents match-fixing (Numerato, 2016). Not all sport competitions and leagues are observed by betting authorities using crawler-software, and these authorities cannot monitor bets that occur in the unregulated illegal or grey markets. Similarly, even if those betting on the outcomes of matches are discovered through monitoring the market, the chances this implicates organized crime remains low because of how easily they can distance themselves from those placing the bets and organizing the fixes directly.

Esports and Anonymity

Esports exacerbates the problem of match-fixing because of the greater level of anonymity it provides. Outside of the most elite competitions, where participants are required to compete in-person at a designated arena, esports occur on an online space where competition takes place in an exclusively virtual medium. Players at the lower tiers of competition remain partially (physically) removed from the activity because they are not directly connected to the observed actions of the character, or object, they control. More overtly, competitors can participate in esports by logging into another player's account with the necessary password. One player can possess multiple accounts and hide their true identity behind the usernames attached to these accounts. This phenomenon is quite common in instances where players want to, for example, practice with a new character by participating in the amateur divisions, referred to as "smurfing" in the esports community, an issue that differentiates anonymity in traditional sports compared to esports (Besharaty, 2022). Through smurfing an elite player could participate in lower-ranked competition with a new account that starts them off at the lowest competitive tier under a different username. Match-fixing could occur where higher-skilled players use smurf accounts to win mismatches against less-skilled competitors —a set of circumstances which an insider who knows the real skill-level of the players

involved could exploit for personal gain on the betting market. Smurf accounts can also be made to avoid bans for violating rules. A player with an account banned for cheating behavior can simply create a different account to continue competing. Smurf detection is a feature used by some game publishers (Besharaty, 2022) to address this problem, but the system cannot detect all smurf accounts. Where the ban originates from matters. If the ban is enforced by the game publishers, then the ban will most likely be an IP ban by prohibiting the usage of any account from that IP address, smurf or not. However, players can dodge IP bans through easily accessible virtual private networks (VPNs).

Players are not the only ones who benefit from this anonymity. Organized crime can exploit anonymity of esports for match-fixing, using player accounts to bet with skins. Skin-betting protects anonymity more securely than betting with traditional currencies. Skin-betting is mostly unregulated, which inhibits the usefulness of the crawler-software technology used in the regulated legal markets (McHale, 2018; Numerato, 2016), and skins are wagered through player accounts, rather than through betting operators, which masks identification. No background checks are required, tracking the use of skins is difficult, and linking the skins wagered to the organized criminal network is an exercise in futility for any potential regulators in the industry or law enforcement. The anonymity inherent to skin-betting presents a tempting target for organized crime given the low risk of discovery and high profit skin-betting provides. Match-fixing cases involving skins have occurred, which highlights this potential risk. The North American *Counter-Strike* match-fixing scandal was initiated by IBuyPower, one of the top *Counter-Strike* teams at the time in 2014 (Lu, 2022; Freitas et al., 2021). After investigation of suspicious activities, the game publishing company Valve found that four members of the team bet expensive skins on the matches, which they then exchanged for traditional currency (Durrani, 2016).

The following hypothetical example highlights the temptation skin-betting anonymity presents for organized crime. Consider a representative of organized crime seeking the ideal market in which to match-fix. In esports, large profits can be made from a manipulated esports event by placing a wager on the outcome, or a series of derivate bets on a variety of elements of the contest. The individual naturally wants to avoid detection and capture. Any legal and regulated betting market offering esports events is likely monitored by some form of software that can detect unnatural movements in the odds. The traditional sport betting market is similarly monitored, with many major professional leagues hiring a betting monitoring company to discover incidents of match-fixing (Rebeggiani, 2015; Carpenter, 2012; Kerr, 2017; McHale, 2018). Risk of detection exists, which may act as a successful deterrent. Fortunately for our would-be match-fixer, an alternative option can significantly reduce the risk of detection exists: skin-betting.

The only obstacle in using a skin as virtual currency to bet is that the representative must login using a player's online account to the relevant gaming platform; however, this requires no age or ID-verification checks (Greer et al., 2019). As noted previously, esports accounts do not necessarily have to be linked to the same person and an individual can have multiple accounts. The skins can then be transferred to a third-party website to wager on an ongoing competition, and then the skins can be cashed out and converted into traditional currency without necessitating further user identification (Thorhauge & Nielsen, 2021). Using skins as digital currency does not require a bank or credit card provider to facilitate the payment process; rather, items are accessed on an online platform's digital inventory.

Routine Activities Theory

The previous example illustrates the benefit of skin-betting for match-fixers. Skin-betting offers an alternative to legal betting for match-fixers that lowers the chance of discovery and capture. In other words, skin-betting reduces the potential cost for those interested in match-fixing. Criminological theory can provide a lens under which to better evaluate how that reduced expected cost and high expected rewards leads to the crime of match-fixing. Routine activities theory argues that crime results from a convergence of motivated offenders, suitable targets, and a lack of guardianship (Cohen, & Felson, 1979). When these three elements meet in time and space crime occurs. A motivated offender is a person rationally motivated to pursue crime because the advantages outweigh the disadvantages. Criminals organizing fixes are motivated by the possibilities of money-laundering and profit (Serby, 2012; De Sanctis, 2014), but they need to convince esports players to orchestrate the fix. Esports players are motivated offenders given certain conditions. Research suggests traditional sport competitors who match-fix usually play in the lower divisions and less popular leagues (Boeri & Severgnini, 2013; Sportradar, 2022). These players struggle financially, and in their desperation, they accept lucrative bribes from interested third parties, such as organized crime, to match-fix. As such, motivated esports offenders can be easily identified as those that gain more from a risky venture for additional income. The forthcoming "esports winter", a post-pandemic drop in popularity of esports combined with a potential recession and its impact on advertising (Fragen, 2022), creates a risky environment for esports match-fixing. Esports players will likely make less money than they did before during this esports winter, which may lead to an interest in illicit schemes, such as match-fixing, to generate necessary income.

The suitable target for these fixers from which criminals obtain profit or monetary gain is the esports industry, which includes a variety of stakeholders victimized by the action. These stakeholders include esports actors (players, referees, fans), esports publishers and tournament organizers, and betting markets. The profit and money laundering that results from this behavior is valuable, has negligible inertia, is visible, and

easily accessible. The target is valuable for players and criminals alike because of high profit margins, and highly visible to the esports players primarily because of the strong connection between betting and esports through sponsorship (Freitas, et al., 2021). Most people in modern society are acutely aware of sport betting generally given its significant cultural popularity where many transactions are conducted across a variety of platforms and on a variety of sports (De Sanctis, 2014).

Guardianship is the element of routine activity theory most relevant for esports match-fixing. Guardianship stands in opposition to anonymity: if there is adequate guardianship surrounding a target, potential offenders will not risk committing the crime because of elevated risk of capture. Lack of guardianship contrastingly results in offenders preserving anonymity and remaining undetected. Scholz (2019) claims esports cannot be governed, which raises serious concerns about guardianship of the industry. Esports guardianship is limited due to a lack of coordination and cooperation between the relevant stakeholders, which makes discovering and prosecuting match-fixing extremely difficult (Moriconi & De Cima, 2019; Boeri & Severgnini, 2013; Huggins, 2018). Nyström and colleagues (2022) observed that the current fragmented ecosystem of regulating systems negatively impacts the ultimate viability of the esports industry. There are at least eight international federations in esports claiming to govern esports worldwide, and each one exists in a market-based environment with its own context and conditions (Nyström et al., 2022). There currently exists a lack of industry standards, publishers pushing their own agendas related to profit maximization, each competition with its own set of rules and policies, and a multitude of regulators competing for power and legitimacy within the larger esports ecosystem (Nyström et al., 2022; Martinelli, 2019). Who regulates and in what respect for esports match-fixing remains a lingering question.

Potential Solutions

An exhaustive evaluation of preventing esports match-fixing via skin-betting is beyond the scope of this paper; nevertheless, the work here would be remiss in its failure to present several ideas for how to better protect esports from this criminal threat. Relying on external regulation seems problematic, and there are issues with esports to self-govern. An initial strategy reveals itself to be of primary importance. Awareness of the issue of esports match-fixing through skin-betting must be improved.

Potentially the most obvious solution is to eradicate the mechanisms which allow skin-betting. Game publishers such as *Valve* have attempted to ban external skin-betting sites and the sites used to exchange skins (Frank, 2016); however, skin-betting is still immensely popular with a wide variety of unregulated websites available for interested gamblers ("Best sites for CSCGO gambling", 2022). Game publishers responsible for banning skin-betting sites are the same companies that profit from the games being played, and as a result their incentive to regulate effectively is uncertain.

Selling and trading of skins is profitable for game publishers and platforms: game publishers enjoy an increase in the sale of skins, while the game platforms benefit from increased user traffic online. As players bet more frequently, they spend more money and time on the games themselves. As a result, regardless of the ability to ban skin-betting websites, the responsible authorities may lack motivation to regulate skin-betting. It seems unlikely to expect a for-profit business to address the issue unless they are legally obligated, or it significantly threatens their profit margins.

Enforcing the ban of skin-betting websites through legislation is unrealistic. Skin-betting could be outlawed, with any bets placed on those websites deemed illegal; however, restricting and banning traditional sport betting is discussed extensively in the literature where authors repeatedly conclude that the method is insufficient and impractical (Dietl & Weingartner, 2014; Forrest, 2013; Rebeggiani, 2015; Serby, 2015; Tak, Sam, & Jackson, 2018; Holden & Rodenberg, 2015). Huggins (2018) argues that the majority of sport betting occurs in unregulated markets as opposed to the legal markets, and these markets are difficult or even impossible to monitor and regulate. Legalizing betting at least allows a space where authorities can monitor the betting odds for manipulations. The problem with skin-betting is that the platforms it occurs on are mostly unregulated third-party websites. Discovering and then shutting down those websites is possible (Frank, 2016), but for every site shut down another can take its place. Furthermore, even if the use of skin-betting websites is made illegal in some countries, users can access those websites offered in other countries. The virtual space where skin-betting occurs offers a rich and robust grey and illegal market that may ultimately evade any attempts at regulation.

Game publishers are the regulatory power in esports (Nyström et al., 2022), and as such they should do more to regulate skin-betting and protect esports and its stakeholders. Game publishers can track player account purchases of skins, as well as the presence of third-party extensions for skin-betting and skin-exchanging websites (Nyström et al., 2022; Thorhauge & Nielsen, 2021). This allows game publishers to identify which user accounts are involved in skin-betting and subsequently ban them. Problematically, game publishers lack oversight to keep them accountable. Unlike traditional sports, there is no global esports authority that can force esports game publishers, through sanctions and bans, to comply with a hypothetical set of rules preventing skin-betting (Martinelli, 2019; Nyström et al., 2022). Their motivation and ability to regulate skin-betting remains uncertain. However, as indicated by the case in Korean esports (Ashcraft, 2016), and other traditional sports (Hill, 2010; Forrest, 2017), leagues can and will collapse because of match-fixing. Awareness of this potential negative economic consequence could be pivotal for initiating the participation of the game publishers in the efforts to address match-fixing.

Raising awareness is pivotal, not just for game publishers, but for the entire esports community including sponsors, game operators, players,

and consumers. Improved efforts to raise awareness is supported by studies that indicate esports norms surrounding cheating and match-fixing are problematic (Irwin & Naweed, 2018), and the esports community's knowledge of connections between esports betting and organized crime is minimal (Abarbanel & Johnson, 2019). *Counter-Strike* spectators disagreed on perceptions of match-fixing behavior by esports players (Irwin & Naweed, 2018). While some did not look favorably upon throwing matches, other participants expressed empathy towards match-fixers. These spectators justified the behavior of esports players because of the extremely short lifespan of esports careers and the difficulty faced by professional players in making a stable financial career out of esports. Normalizing and rationalizing corrupt behavior, such as match-fixing, makes it more likely that corruption will occur (Campbell & Göretz, 2014). These attitudes and norms in the esports community that create empathy towards match-fixing could be the result of a lack of education, as suggested by an empirical study on consumer awareness and attitudes towards betting-related match-fixing. A survey of esports fans and players in the United States of America, distributed by the Esports Integrity Coalition, revealed a profound lack of awareness about betting-related match-fixing (Abarbanel & Johnson, 2019), specifically regarding the complexity of the match-fixing and the connection to criminal involvement, as well as the comprehensive damage of the phenomenon. This general acceptance of match-fixing prevents the esports community from developing a unified stance against the issue and highlights the need for raising awareness.

Knowledge on skin-betting and its connection to match-fixing is similarly minimal and must be strengthened. Discussions must move beyond the current debate concerning the value of skins. Research on skin-betting is largely limited to discussions of whether betting with skins even counts as gambling, which hinges on the possible value these in-game items hold (Zendle & Cairns, 2018; Greer et al., 2019; Holden & Ehrlich, 2017; Spicer et al., 2021). For example, one oft cited case of skin-betting in is that of *Unite States vs Clark*. Anthony Clark fraudulently obtained FIFA esports coins and then sold them. Clark's argument in court relied on the objection that the coins possessed no value, therefore fraud did not occur (Holden & Ehrlich, 2017). Clark was unsuccessful in his argument, and the court ruled that the skins did in fact have value. Clark was convicted of defrauding the EA gaming company of $16 million USD in FIFA coins. Holden & Ehrlich (2017) acknowledge that this case could be a basis for understanding how to apply a wire fraud statute to cases involving skins. However, other court rulings on skins and other in-game items have found that they do not possess value as a currency (Zendle & Cairns, 2018; Greer et al., 2019). In recent years a shift seems to be occurring with several Asian countries, Belgium, the Netherlands, and the Isle of Man all legally recognizing the value of in-game items, resulting in bans and limits of the sale of loot boxes (Zanescu et al., 2021). A global consensus may soon be reached regarding the value of skins as currency and, as the evidence in this article suggests, the

importance of this matters beyond cases akin to Anthony Clark. Technically, no crime of fraud or money laundering is committed if the skins lack value as currency when they are placed on third-party unregulated gambling sites. Without uniform consensus it is highly improbable to successfully investigate and prosecute cases of match-fixing in esports that involve wagers made through skins, particularly those that cross international borders where laws on the value of skins differs. The uncertain legal value of skins (Thorhauge & Nielsen, 2021; Spicer et al., 2021) could result in the failure to apply gambling legislation to case of match-fixing that involve skin-betting.

Conclusions

Match-fixing occurs in both traditional sports and esports, and in both forms it presents problematic outcomes for esports stakeholders if left unchecked. Key differences exist in esports match-fixing, with skin-betting one such issue unique to the genre. Skin-betting allows criminals to exploit esports under the veil of anonymity. The theoretical implication is that skin-betting in esports presents a significant issue because it allows for almost complete anonymity in organizing and committing match-fixing. The reduced risk of detection in esports match-fixing due to skin-betting contrasts with potentially higher risk of detection in traditional sports and betting with traditional currency. The primary aim of this paper has been to build awareness of connections between organized crime involvement, match-fixing, and skin-betting in esports.

The work presented here is the first in the academic discourse that directly addresses the link between skin-betting and the involvement of organized crime in esports match-fixing. Organized crime transitioning from traditional sprot to esports to generate revenue and launder money through skin-betting seems inevitable. This article considers the problem of skin-betting from a criminal justice perspective using theories of criminology to evaluate the risk of esports match-fixing. The research discussed here suggests that recognition of the high risk of using skins for money-laundering, fraud, and bribery in the process of fixing esports matches is low at best, nonexistent at worst. There is a need to move beyond merely considering the actual value of skins, in a way that brings awareness to why a consensus on this point matters from a legal and criminal justice perspective. There could be other crimes besides match-fixing that use skins as a method of payment that similarly require further consideration beyond the scope of this paper. The ability of the esports industry and external stakeholders to regulate these crimes remains in question. Future research should further consider the risk of esports match-fixing, and the ability of the industry to respond to this threat. For esports authorities and interested stakeholders to ignore esports match-fixing via skin-betting is at their own peril.

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AZ drafted the paper and conceived the study, with PB developing the methodology and helping to write parts of the article. AZ revised the first draft with advice from PB, apart from the methodology revisions which were handled directly by PB. All authors approved of the final version.

Research Promotion
Match-fixing threatens the sustainability of the esports industry. This paper highlights the unique risk of "skin-betting" in esports from a criminal justice perspective, according to drift theory and routine activities theory. This scoping review reveals that the risk of criminal exploitation of esports through match-fixing is high given the anonymity inherent to skin-betting.

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