



Received: 26 June 2018
Accepted: 17 January 2019
First Published: 24 January 2019

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Reviewing editor:
Vassil Kirginov, Life Sciences, Brunel University, UK

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SPORTS & EXERCISE | REVIEW ARTICLE

How should sports match fixing be classified?

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Abstract: The purpose of this study was to classify sports match fixing based on the scope of human network and financial involvement. We analyze the concept of match fixing as defined by the International Olympic Committee and create a classification scheme based on four types of match fixing behavior: type 1—organization-based match fixing with money involved within an internal–external human network, type 2—relationship-based match fixing with the involvement of an internal–external human network without monetary involvement, type 3—sustenance-based match fixing with money involved within an internal human network, and type 4—goal-based match fixing with the involvement of an internal human network without monetary involvement. Lastly, we need to consider variables intrinsic and extrinsic to a sports game, which should be carefully examined and managed depending on the match fixing type to prevent match fixing behavior.

Subjects: Sport and Social Problems; Sports Management; Sports Business

Keywords: match fixing; sport ethics; monetary involvement; internal human network; external human network

1. Introduction

Presently, match fixing is at the core of players' problematic behavior, although not the only problem for players, that devalues sports. Traditionally, match fixing is considered as behavior in which a match is played according to a predetermined course or to a preset outcome. Many people enjoy sports because of the uncertainty of results (Pawlowski & Anders, 2012), but if the result of a sports game is predetermined, there would be no reason for spectators to be interested in the



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PUBLIC INTEREST STATEMENT

The purpose of this study is to classify the types of match fixing that occur in sports. It is not easy to catch the match fixing of sports behavior because the match fixing is made by private transactions. The main contribution of this paper is that it is the first to categorize match fixing based on different types, enabling the discovery of different solutions for different types of match fixing. We believe that this contribution is practically relevant because of the extent of match fixing in the world across sports types and countries. This research is of particular interest and use to international inter-disciplinary scholars, who comprise the majority of sports fields or others. Furthermore, we believe that the findings are useful because they relate to one of the most pressing and far-reaching issues plaguing sports today: match fixing.

game. Therefore, the uncertainty of outcomes must be viewed as the fundamental value of sports (Andreff, 2014).

It is well known that match fixing negatively affects society in general, beyond the sports field, but it is not easy to identify the specific type of behavior that amounts to match fixing (International Centre for Sport Security, 2014). For instance, match fixing does not easily reveal itself because the transaction occurs in secret with only those involved in the game (Majumdar, 2015), and it is difficult to charge individuals for match fixing and penalize them because those involved in match fixing characteristically will not acknowledge their manipulative conduct. In addition, because individuals' subjective perspectives determine whether a particular incident amounts to match fixing (Pielke, 2012), there is a lack of consistency in strategies to deal with match fixing (Chappelet, 2015).

Most people would agree with the general definition of match fixing as athletes who deliberately do not work to their maximum ability in the competitions. However, it is also true that athletes commonly do not perform to their maximum ability in some competitions on purpose. For example, in general, the world's top-class runners competing in a 100 m race do not run to their fullest capacity in a qualifying competition. In addition, in Olympic or FIFA World Cup soccer matches, it is a common practice to allow reserve players to play games remaining after the top 16 teams have been determined in qualifying contests, so as to prevent injuries and maintain peak conditions of main players in the knockout stages as part of longer-term strategies (Torio & Ghani, 2018).

Pielke (2012) argued that the decision on whether an incident is a match fixing case is made from a subjective point of view because the current definition of match fixing by international sports organizations is vague. A vague definition of match fixing makes it unclear which behavior falls under match fixing, and accordingly, the question about which behavior should be carefully managed to prevent match fixing cannot be answered.

How should it be judged if players do not put their best efforts into a qualifying game in order to receive a more favorable seeding in the knockout stage? During the 2012 London Olympics, players in badminton and football did not perform to their true ability in order to meet favorable opponents at knockout stages. However, the World Badminton Federation concluded that the behavior was match fixing (Selliaas, 2012), whereas FIFA determined it to be tactical behavior (JDP, 2012), not match fixing (Chappelet, 2015).

The presence of different subjective perspectives in defining match fixing may result from a lack of a clear conceptualization of this issue. A definition of match fixing in sports can be limited to behavior related to financial gain (Bag & Saha, 2011; Forrest & Simmons, 2003) or can be more extensive by also including behavior irrelevant to financial gain. For the primary cause of match fixing, although it is convenient to consider that many people are involved in match fixing for financial gain, Chappelet (2015) reported that only one out of five Olympic incidents of match fixing involved financial gain. This finding suggests that types of match fixing should be differentiated between those involving and not involving financial gain and should be understood from different points of view. In addition, some incidents of match fixing may involve small networks of people in which single players, coaches, or referees are involved (BBC Sport, 2009). On the other hand, incidents with large networks of people have been reported, including players, coaches, and/or referees in coordination with brokers, to manipulate game outcomes (Abbott & Sheehan, 2014). As match fixing is human behavior, the scope of human networks involved in match fixing incidents should be critically examined.

2. Purpose

In this study, we aimed to classify the type of match fixing on the basis of two dimensions involved in sports match fixing, that is, financial gain and the scope of the human network. Consequently,

we classified match fixing through a systematic literature review, based on these two dimensions, and attempted deductive approaches to find cases that conform to these dimensions. As sports match fixing has different characteristics depending on the type, the classification can provide a foundation to establish appropriate coping strategies for each type of match fixing.

3. The concept of match fixing

International sports organizations, like the International Olympic Committee (IOC) and the Fédération Internationale de Football Association (FIFA), define match fixing as behavior that damages the fundamental value of sports, namely, the uncertainty of outcomes, and that is a threat to sports (Chappelet, 2015). These organizations have declared that they would strongly fight against match fixing. According to Jacques Rogge, who served as the president of the IOC from 2001 to 2013, whereas doping in sports may be considered a behavior that negatively affects individual athletes only, match fixing is a much more serious problem than doping because it threatens fair competition itself, which is the fundamental element in sports (Carpenter, 2012). Rogge requested special efforts to be made to prevent match fixing, particularly because it has spread worldwide to sports in general, rather than having a localized tendency limited to specific sports or specific countries. Accordingly, in 2015, the IOC announced the Olympic Movement Code (OMC) for the Prevention of the Manipulation of Competitions. The IOC (2015) introduced a variety of strategies in the OMC to prevent match fixing. For example, the OMC encouraged sports organizations to establish constant surveillance systems to prevent match fixing and suggested that athletes, referees, and officials should be provided educational programs regarding the code of conduct to handle the temptation of match fixing.

To classify sports match fixing, first, it is necessary to define clearly the kind of behavior that is considered match fixing. The Cambridge dictionary defines sports match fixing as a “dishonest activity to ensure that one team wins a particular sports match” (Cambridge, 2016). With the announcement of the OMC, the IOC (2015) has defined sports match fixing in an extensive sense, by including “intentional arrangement”, “intentional act”, and “intentional omission” to unjustly alter the outcome or the course of a sports competition. The precise IOC (2015) definition of sports match fixing is as follows:

Manipulation of sports competitions is an intentional arrangement, act, or omission aimed at an improper alteration of the result or the course of a sports competition in order to remove all or part of the unpredictable nature of the sports competition with a view to obtaining an undue benefit for oneself or for others (IOC, 2015).

One interpretation of the IOC (2015) definition of sports match fixing is that it is the behavior of “intentional arrangement”, “intentional act”, or “intentional omission” to alter the outcome or the course of a sports game through unfair means. Thus, based on this definition, the scope of match fixing is extensive. For example, buying off a referee to judge in favor of a particular player would be an “intentional arrangement” to alter the outcome or course of a game with an unjust method; a deliberate defeat in order to meet a favorable opponent later would be an “intentional omission”; and taking an illegal drug to enhance performance at a level higher than true ability would be an “intentional act” to alter the outcome or course of a competition using an unjust method. In other words, from the perspective of the IOC (2015), doping behavior, like taking a banned drug, is considered an instance of match fixing in an extensive sense.

Hence, it would be suitable to view sports match fixing inclusively, as athletes’ deliberate underperformance scripted with the involvement of individuals such as athletes, coaches, referees, and officials or behavior with an aim to enhance performance at a level higher than true ability by means of an illegal or unjust method in the entire competition or part of it.

4. Two elements involved in match fixing

Previous studies on sports match fixing (Aquilina & Chetcuti, 2014; Forrest, 2012; Haberfeld & Sheehan, 2014) viewed unfair financial gain through illegal sports betting as a critical factor in the involvement of match fixing. Clearly, financial gain is a motivation for match fixing, but not all cases of sports match fixing involve money. In analysis of five incidents of past Olympic games in which match fixing was confirmed, Chappelet (2015) showed that only one of those cases was to obtain financial gain through illegal betting (i.e., sailing at Beijing 2008), and of the remaining cases, two involved deliberate defeat (i.e., ice hockey at Turin 2006 and badminton at London 2012) and the other two involved an unfair decision by referees (i.e., boxing at Seoul 1988 and figure skating at Salt Lake City 2002).

Of course, it cannot be presumed that the two cases of deliberate underperformance and the two cases of referees' unfair decisions were unrelated to money. They were, primarily, not to obtain a financial gain but to meet a favorable opponent in the final game (i.e., deliberate underperformance) or for a referee to award an outcome favorable to an athlete of the same country of origin (i.e., a referee's unfair decision).

It is not difficult to find cases in which sports match fixing was attempted. In fact, the list would be very long if one were to include individual cases of match fixing occurring in sports such as basketball, volleyball, tennis, and horse racing without limiting the investigation to particular sports or regions (Holden & Rodenberg, 2015), starting with the case of the European Football League in which a referee was bought off to manipulate game outcome (Carpenter, 2012). Recently, match fixing linked to crime organizations (e.g., mafias or cartels) has manifested in threats and violence (Carpenter, 2013; Gokhale, 2009; Hill, 2010; Holden & Rodenberg, 2015), and match fixing behavior based on close personal relationships to help players in particular games (i.e., crashgate in Renault's car racing team) to be judged favorably has been observed (Carpenter, 2012; Cary, 2010). Close human relationships in the sports arena establish networks of people, including international sports organization officials, referees and umpires, team coaches, and athletes, who directly or indirectly influence the outcome of sports competitions.

As discussed in the previous section on the two elements involved in match fixing, it can be understood on the basis of two dimensions, that is, the pursuit of financial gain and the scope of people involved in match fixing. The first dimension is whether there is financial gain made through an unjust method. Many people consider the goal of match fixing behavior as obtaining financial gain by using an unjust means (Carpenter, 2012; Gokhale, 2009; Holden & Rodenberg, 2015). The reason that people commonly relate illegal sports betting to match fixing is that large amounts of money are transacted in illegal sports betting, and the gains and losses of interested parties change dramatically depending on the game outcome. If a match fixing broker makes a suggestion for match fixing to athletes, coaches, or referees of a game with large amounts of money as bait, it would not be easy for some individuals to resist the temptation to accept the bribe. Indeed, money is a critical dimension in explaining match fixing behavior, and thus, match fixing can be classified into two categories of matching fixing: with and without monetary involvement.

The other dimension of match fixing involves human networks. Match fixing is human behavior. Specifically, in match fixing, there are people who suggest engaging in it, those who accept the suggestion, and those who actually participate in it, all of whom form an interpersonal network. To achieve a preferred outcome from a game, an individual can help a player or team of players in a close personal relationship or can ask a favor, demand, or threaten using a close personal relationship as a weapon (Carpenter, 2012). In a case in which winning is manipulated to help a teammate who is about to be expelled for low performance renew a contract (Cary, 2010), the primary motivation is not money. In such cases, the size of the human network involved in match fixing can be small, for example, a network of coaching staff, practice partners, etc., whose interest is in the performance of a teammate (or the entire team), or it can be large, such as, a network extending to brokers, crime organizations, referees, etc., whose interest is irrelevant to the performance. We define the former as

Table 1. Types of sports match fixing

		Monetary involvement	
		Money involved	Money not involved
Human network	Internal-external network	Type 1 Organization-based match fixing	Type 2 Relation-based match fixing
	Internal network	Type 3 Sustenance-based match fixing	Type 4 Goal-based match fixing

internal networks and the latter as internal-external networks. Thus, based on the dimension of human networks, match fixing is classified into two categories, one that occurs within an internal network, and the other that occurs within an internal-external network.

5. Types of match fixing

Match fixing can be categorized into four types based on the two dimensions of sports match fixing, that is, monetary involvement and scope of the human network, as shown in Table 1. The four types are organization-based match fixing with money involved within an internal-external network as type 1, relationship-based match fixing with the involvement of an internal-external network without money involved as type 2, sustenance-based match fixing with money involved within an internal network as type 3, and goal-based match fixing with the involvement of an internal network without money involved as type 4.

5.1. Type 1: organization-based match fixing (money is involved within an internal-external network)

5.1.1. Case 1

In 2011, there was a scandal involving approximately 70 brokers and players from the Korea Professional Football League, who were indicted for match fixing (Abbott & Sheehan, 2014). Players received money from the brokers and altered the outcomes of 15 games by deliberate foul play. This was shocking, as it was revealed that a player received more than 100,000 USD for fixing four matches. After this incident, approximately 50 players were permanently banned from playing in the league. The case exemplifies the type of organization-based match fixing in which large sums of money are transacted, and both an internal human network with direct relevance to game performance and an external human network without direct interest in performance are involved.

5.1.2. Case 2

For approximately 3 years from 2007 to 2009, 93 Zimbabwean football players and officials received penalties for match fixing (Carpenter, 2013). The players were paid 3,200–4,000 USD per game and, in exchange, deliberately underperformed in football games held in Asian countries, including Malaysia, Vietnam, Singapore, Oman, and China (Richard, 2013). They fixed the matches after receiving money from brokers for an illegal betting organization in Singapore, and those players involved in match fixing were penalized at different levels of severity from permanent banning to 10-year suspensions, depending on the degree of involvement. This case is an example of organization-based match fixing with the involvement of money and an internal-external human network.

5.2. Type 2: relationship-based match fixing (internal-external network is involved without money involvement)

5.2.1. Case 1

In a free pair-skating program during the 2002 Salt Lake City Winter Olympic Games, Yelena Berezhnaya and Anton Sikharulidze of Russia, who made a performance error, won a gold medal over Jamie Salé and David Pelletier, who displayed perfect performance (Farris, 2016). An

investigation revealed a concealed promise between the French and Russian Skating Federations that France would win a gold medal in ice dancing and Russia would win one in pair skating. The French judge of the pair-skating competition, Reine Le Gougne, testified that she was pressured by the French Skating Federation to judge Russian skaters favorably, and the IOC concluded that this was misconduct by the judge. The scandal is a case of relationship-based match fixing involving an internal-external human network, although money was not the motive.

5.2.2. Case 2

In 2008, Nelson Piquet Jr. of the Renault team intentionally crashed into the circuit wall during the Formula One (F1) Grand Prix final race held in Singapore to help his teammate, Fernando Alonso, to win (Cary, 2010). Alonso won for the first time in 2008, and Piquet was suspected of causing the accident deliberately to help Alonso win the race in the following year. As the winner of the race, Alonso, who had been on the verge of being fired due to a low-performance level up to 2008, was not fired from Renault. The incident, known as Crashgate, contained circumstantial evidence that Piquet had helped Alonso to win, but there was no conclusive evidence of a financial arrangement, and thus, Alonso was judged not guilty although the Renault team was disciplined. The case is another example of relationship-based match fixing in which an internal-external human network was involved without monetary involvement.

5.3. Type 3: sustenance-based match fixing (money is involved within an internal network)

5.3.1. Case 1

In 2008, four football players of Accrington Stanley Football Club, a lower-tier team in the English football league system, bet on their own game. In the match between Accrington and Bury, all of them bet 1,000–4,000 GBP on their opponent, Bury, winning the game. Bury won 2–0. Although the Football Association was not able to confirm that the players fixed the outcome of the game, the association permanently banned all players. It is not clear what match fixing behavior was conducted by the players of the team, that is, the agent of the competition (internal human network), but most of the press believed that the players betted on Bury winning and manipulated their performance. The case is an example of sustenance-based match fixing with monetary involvement with an internal human network.

5.3.2. Case 2

In the 2015 Korean Basketball League, the Busan KT coach, C.J. Chun, betted on the game played by his players and fixed match outcomes to unfairly obtain a financial gain (Fox Sports, 2015). Chun bet against his own team, that it would lose by more than 10 points, and let bench players play in place of main players in the third and fourth quarters to ensure a loss of more than 10 points. The prosecutor argued that in return, Chun received a high-yield payout (more than 200%). This incident is considered a case of sustenance-based match fixing with money involved within an internal human network, as Chun alone was involved in the betting and committed match fixing.

5.4. Type 4: goal-based match fixing (internal network is involved without money involvement)

Goal-based match fixing occurs within the scope of an internal human network without monetary involvement; tactical behavior and doping to achieve a goal can be classified as this type of match fixing. Tactical behavior of the goal-based match fixing type is accepted by most sports organizations. An example of goal-based match fixing is as follows: reserve players are sent out to play in qualifying match games in order for main players to save their energy to play better in final tournament games.

Goal-based match fixing via doping is the behavior of athletes for enhancing performance to a level higher than their true ability by using banned drugs and can be considered as match fixing in a wide sense. To prevent goal-based match fixing by means of doping, athletes are continuously monitored by the World Anti-Doping Agency (WADA), and an athlete taking an illegal drug for any reason must take full responsibility because it is considered unethical conduct to mislead others about his or her true ability. The following are example cases of goal-based match fixing using tactical behavior and doping.

5.4.1. *Tactical behavior case*

In the final games of the qualifying contests for the women's doubles tournament during the 2012 London Olympics, eight players from South Korea, China, and Indonesia deliberately tried to lose their matches (Chappelet, 2015). Before their matches, it was determined that the world's top-ranked women's doubles team, that is, Tian Qing and Zhao Yunlei from China, would enter the knockout stage (dead rubber) as second place, and thus, the eight players were faced with a situation in which they would have to play against the world's top-ranked team if they were to win in the final game of the qualifying contests. Losing the game was the only way in which to avoid this situation and receive a more favorable seeding. The Badminton World Federation (BWF) determined that the eight players who deliberately underperformed were attempting to match fix and penalized all of them. The case is an example of goal-based match fixing involving an internal human network without monetary involvement.

However, incidents of goal-based match fixing using tactical behavior often end up with no disciplinary action. Unlike the aforementioned Badminton case, in the 2012 London Olympics, the head coach of the Japanese women's football team instructed his players not to win the final match for qualification against the South African team, whose skill was at a lower level. The Japanese team ended up not winning the game, following the head coach's instruction by stalling the game, manipulating the attack tempo, and so on (Chappelet, 2015). There was much controversy around the match, but FIFA concluded that the game had not been influenced by match fixing, and its decision differed from that made by the BWF with regard to the eight badminton players.

5.4.2. *Doping case*

Marion Jones, a US track and field athlete, won five medals, including three gold medals, during the 2000 Sydney Olympics. However, later she was stripped of all medals by the International Association of Athletics Federations and the IOC, as it was found that since 1999, she had been taking "The Clear", containing steroids provided by her coach. In addition, she was stripped of her records (Shipley, 2007). This is a case of goal-related match fixing that occurs within an internal human network without monetary involvement.

Goal-based match fixing by means of doping is clearly detected through doping tests, and athletes charged with match fixing behavior via doping are punished severely. In addition, illegal modification of sports equipment to achieve a goal can be classified as this type of match fixing. An example is motorized doping, which some cyclists illegally use during cycling races (Cyclingnews, 2016). This falls under match fixing, in that sportspeople attempt to unlawfully enhance their performance levels above their true abilities by using illegal tools.

6. Discussion

The purpose of this study is to classify the types of sports match fixing based on the scope of human network and financial involvement. The main contribution of this paper is that it is the first to categorize match fixing based on different types, enabling the discovery of different solutions for different types of match fixing. We believe that this contribution is practically relevant because of the extent of match fixing in the world across sports types and countries.

Match fixing is not easily revealed to the outside world because it occurs through concealed exchanges between involved parties. However, different types of match fixing have their own specific features, and therefore, we believe that solutions to discourage match fixing might be found by examining those features. In the present study, we classified match fixing into four types based on financial involvement and scope of human networks, that is, organization-based, relationship-based, sustenance-based, and goal-based (tactical behavior and doping) match fixing. In Table 2, we present different variables of interest that are intrinsic and extrinsic to a match game, which can be closely examined and screened according to the match fixing type. In particular, some studies are attempting to statistically detect match fixing (Park, Choi, & Cho, 2016).

Table 2. Variables of interest to be screened according to match fixing type

	Monetary involvement	Human network	Variables intrinsic to the match	Variables extrinsic to the match
<i>Type 1</i> Organization-based	High	Internal-external	<ul style="list-style-type: none"> • Unexpected game outcome • Errors made by player • Biased misjudgment by referee 	<ul style="list-style-type: none"> • Unlawful betting records • Dividend payment to betting winners • Records of financial dealings
<i>Type 2</i> Relationship-based	Low	Internal-external	<ul style="list-style-type: none"> • Tanking behavior of player • Unjust benefits given to particular player • Biased misjudgment by referee 	<ul style="list-style-type: none"> • Close personal relationship
<i>Type 3</i> Sustenance-based	High	Internal	<ul style="list-style-type: none"> • Unexpected game outcome • Errors made by player 	<ul style="list-style-type: none"> • Betting by player, coach, or referee
<i>Type 4</i> Goal-based	Low	Internal	Tactics <ul style="list-style-type: none"> • Tanking behavior of player • Game entered by reserve player 	<ul style="list-style-type: none"> • Dead-rubber situation during qualifying matches
			Doping (use of illegal equipment) <ul style="list-style-type: none"> • Superior performance compared to true ability 	<ul style="list-style-type: none"> • Positive result on a doping test • Regulations and management of equipment

Because the level of financial involvement is high and people both internal and external to the sports team are involved in organization-based match fixing, an unexpected game outcome, too obvious a mistake by a player, biased misjudgment by the referee, etc., should be examined and screened attentively. In addition, for extrinsic variables, unlawful betting records, significantly large dividend payments, and financial transactions between individuals may be found as consequences of organization-based match fixing. Relationship-based match fixing involves people in and out of sports teams with no money involved. Hence, for intrinsic variables, tanking behavior of players, unjust benefits to specific players, biased misjudgment by referees, etc., should be screened. For extrinsic variables, close personal relationships among stakeholders should be monitored in particular.

Sustenance-based match fixing can manifest as a player betting on his or her own game alone or with a small number of teammates for financial gain. Accordingly, sustenance-based match fixing can be managed by completely forbidding anyone relevant to the game from betting. Goal-based match fixing manifests as tactical behavior or doping, which can be observed in players' tanking behavior or reserve players entering the game during a qualifying game in a dead-rubber situation. Until now, doping in sports has been viewed from only an ethical viewpoint (de Hon, Kuipers, & van Bottenburg, 2015), but it can be considered too as match fixing, in that regardless of whether it uses a banned drug or illegal equipment, the purpose is to enhance performance level above true ability with an unlawful method. Goal-based match fixing is preventable by managing illegal equipment and dead-rubber situations in similar ways that WADA uses to manage illegal.

This study was not based on match fixing data of sports area that had occurred in the past. Because the analysis of match fixing type is logically based on literature only, there may be

restrictions on the application of actual situations of sports. Nonetheless, we are confident that this study will contribute to further discussion of match fixing in the sports sector.

7. Conclusion

Previous research on sports match fixing has treated match fixing as a whole, without categorizing it into different types. Hence, it was difficult to diagnose, prevent, and manage match fixing behavior. In the present study, we classified match fixing on the basis of the scope of the human network involved and whether it is motivated by a financial gain, in order to provide a foundation for systematic analysis of a practice that threatens the existence of sports. Moreover, this study categorized the dimensions of match fixing based on previous research and uses deductive reasoning to identify match fixing cases. Although the study has some limitations in that it restricted the dimensions of match fixing to specific cases, it established a basis for categorizing and analyzing match fixing from various comprehensive viewpoints.

In conclusion, sports match fixing can be categorized into four types: organization-based match fixing with money involved within an internal–external human network as type 1; relationship-based match fixing occurring with the involvement of an internal–external human network but not money as type 2; sustenance-based match fixing with monetary involvement within an internal human network as type 3; and goal-based match fixing occurring with the involvement of an internal human network but not money as type 4. Indexes that should be carefully examined and screened to manage match fixing are different for each of the four types. Therefore, it is expected that future research will establish strategies to prevent match fixing behavior and develop a model to detect such behavior, by considering the classification scheme suggested in the present study.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This study was supported by the National Research Foundation of Korea Grant funded by the Korean Government (NRF-2014S1A2A2028551).

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Citation information

Cite this article as: How should sports match fixing be classified?, Jae-Hyeon Park, Chang-Hwan Choi & Jiwun Yoon, *Cogent Social Sciences* (2019), 5: 1573595.

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