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An Examination of Travel Effects on Performance Outcomes in Major League Soccer

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Abstract

The home advantage (HA) is a well-documented phenomenon across team sports, including association football (soccer). The effects of travel play a role in the HA, although the nature in which travel affects performance is still unknown. Match data from Major League Soccer (MLS) were used to investigate the role that crowd factors, travel, and team quality play in the HA. The results demonstrated the negative effect of a connecting flight by the visiting team on match outcomes. Also, in comparison to drawn matches, home team wins and losses increased when traveling east.

Keywords: *Home advantage, soccer, football, travel effects, jet lag, crowd effects*

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Introduction

Supporters create a desirable atmosphere for athletes playing games at their home venues compared to playing in an opponent's stadium (Jamieson, 2010). This environment can provide host teams with a home advantage, which is defined as "the consistent finding that home teams in sport competitions win over 50% of games played under a balanced home and away schedule" (Courneya & Carron, 1992, p. 14). The home advantage appears to be universal across all types of sports, although the magnitude varies depending on the sport (Courneya & Carron, 1992). When analyzing the impact of sport type, Jamieson (2010) demonstrated that the home advantage for soccer was stronger than any other sport, with home teams winning 67.4% of matches.

Major League Soccer (MLS) has been operating as the highest level of domestic soccer in the United States soccer pyramid since 1996 (Greyser & Goldman, 1998). Article 11 of the 2015 Collective Bargaining Agreement (CBA) between MLS and the Major League Soccer Players Association (MLSPA) outlines that teams travelling distances greater than 250 miles shall travel by air on regular commercial carriers. In addition, the CBA allows MLS teams to use chartered air transportation for up to four legs of flights per season (Major League Soccer, 2015). Baxter (2016) outlined the contrast of MLS with other North American professional leagues in this regard, who fly exclusively on charter flights. The trips made by MLS teams on commercial air travel range from approximately one to nine hours and are characterized by flight and baggage delays, and uncomfortable middle seats. These disruptions are most likely to impact teams in Vancouver, Seattle, and Houston, who travel more than 40,000 miles by air each season (Baxter, 2016). The length of travel a visiting team endures before a game could disrupt players' routines, resulting in fatigue and poor performance.

Previous research has examined travel and its impact on the home advantage (Smith et al., 2000). However, though important to the successful management of professional sport teams, there has not yet been a study comparing different modes of travel on performance outcomes in sporting competitions (Jamieson, 2010). Thus, the purpose of the present study was to examine how air travel explains match outcomes in MLS.

Literature Review

There are numerous factors that account for sport teams winning a greater percentage of home matches. Carron et al. (2005) advanced a conceptual model of the factors that impacted home advantage, which includes components such as crowd factors, travel factors, and team quality. The model also includes physiological states to consider such as the effects of jet lag (Jehue et al., 1993; Recht et al., 1995).

Crowd factors describe the effect on performance outcomes when the home team is supported by the spectators attending the competition (Courneya & Carron, 1992). Superior performance by the home team evokes as much of a positive

response from a local audience as a superior performance by the visiting team evokes silence and expressions of disappointment (Schwartz & Barsky, 1977). This idea lends well to the assumption that home team players are motivated to behave in ways that evoke social approval. Thus, factors related to the crowd such as density, size, fan behavior, and athletes' perceptions of crowd support all influence the magnitude of the home advantage (Jamieson, 2010). These effects can also be threatening for visiting competitors; having a crowd cheer against their success can be a direct threat to visiting competitors' identities as competent athletes. When an athlete feels threatened, there is an increased tendency to monitor habitual skills to ensure that behaviors are being executed properly, which impairs the execution of those behaviors. The debilitation of visiting competitors' performances, when combined with the facilitation of home competitors' performances, may account for the magnitude of the home advantage (Jamieson, 2010).

Of the factors included in Carron et al.'s (2005) framework, several studies have investigated the effect of travel. Smith et al. (2000) found that travel effects did not account for variation in game outcomes. When examining travel-related fatigue in English professional soccer, Pollard (1986) showed limited support for travel fatigue having an adverse effect on the home advantage. However, it should be noted that travel within England is comparatively brief, with no time zone changes. In contrast, Goumas (2014) demonstrated a relationship between travel effects and the home advantage in Australian soccer, where teams travel across many time zones. As such, a strong positive association between the home advantage and the number of time zones crossed by the visiting team was demonstrated. Specifically, for each time zone crossed by the visiting team, the home advantage increased by approximately 20%. That means when four time zones were crossed, the home team increased its likelihood of winning by roughly 74%. Still, distance travelled did not produce a positive effect on the home advantage after controlling for the number of time zones crossed, indicating that jet lag is the cause of poorer visiting team performance.

In order to explain why visiting performance declined when crossing multiple time zones, Waterhouse et al. (1997) pointed to two main problems caused by jet lag. The first problem is that performance may decline if the timing of the competition does not align with the individual's circadian rhythm. The second problem is that inappropriate training times, increased fatigue, and negative effects on mood will impact physical and mental performance. Directionality was also observed to have an impact on performance (Jehue et al., 1993). Specifically, teams travelling eastward experienced detrimental performances. Similarly, Recht et al. (1995) showed that home teams in baseball scored 1.24 more runs when the visiting team completed eastward travel.

A key problem associated with flights to the east is the difficulty athletes face in getting to sleep at a new bedtime with fewer daylight hours to adjust (Waterhouse et al., 1997). Flights to the west do not experience the same problem as individuals face a premature awakening with the benefit of more daylight hours to adjust to the local time zone. Ultimately, though the sleep difficulties individuals face after

eastward travel can increase the risk of performance decrement (Waterhouse et al.), this may not always be the case. Goumas (2014) presented equivocal findings showing that the direction travelled by the team (i.e., east, west, or neither) was not associated with the home advantage.

If a team is more likely to win a game at home, the magnitude should vary in accordance to the relative quality of the visiting opponents (Schwartz & Barsky, 1977). Bray (1999) hypothesized that low-quality teams may show a greater home advantage than high quality teams since low quality teams win less frequently and, therefore, the home advantage has a greater influence on their ability to win games. In support of this hypothesis, Allen and Jones (2014) demonstrated that teams finishing toward the lower end of the league table showed a greater home advantage than teams finishing toward the higher end of the league table. However, in English professional soccer, Bray et al. (2003) reported that higher quality teams showed a greater home advantage than lower quality teams. Jamieson (2010) concurred with this notion that better teams exhibited a larger home advantage. Regardless of the directionality, the magnitude of the home advantage appears to be dictated by the quality of the participating teams.

The abovementioned studies provide evidence that crowd factors, travel factors, and team quality impact the performance outcomes of visiting teams. The current study builds upon this literature to investigate home advantage using match data from MLS. Specifically, this study quantifies how travel factors explain performance outcomes in MLS, while controlling for crowd factors and team quality. Further, the MLS data examined in this study provide a rich context for investigating travel effects as some teams may travel nearly 3,000 miles and across three time zones for a single game. Based on the above literature, the following hypotheses are advanced:

H_1: There will be a negative relationship between the number of days between the travel day and the match day and the match outcomes of visiting teams.

H_2: There will be a negative relationship between the number of hours travelled before a match and the match outcomes of visiting teams.

H_3: There will be a negative relationship between the number of time zones crossed and the match outcomes of visiting teams.

H_4: There will be a positive relationship between travelling by chartered flight and the match outcomes of visiting teams.

H_5: There will be a negative relationship between incurring a connection while travelling and the match outcomes of visiting teams.

H_6: There will be a negative relationship between completing eastward travel and the match outcomes of visiting teams.

Method

Archival match data were collected from https://www.mlssoccer.com/results for the 2015 through 2017 seasons, which coincides with the travel itineraries that were provided to the researchers by representatives of the MLS head office. MLS was comprised of 20 teams during the 2015 and 2016 seasons, but expanded to 22 teams in 2017, with the addition of New York City FC and Orlando City FC. Each team played 34 regular-season games, half of which were at home. This yielded a sample of 1054 games. Travel information for each game was obtained from travel itineraries created by MLS. Only data pertaining to airline travel were included in the data analyses. For each match, team names and final scores were recorded to interpret the outcome variable (visiting team win, loss, or tie), along with data for the following control and predictor variables.

Crowd size data were included to help isolate the effects of travel in the current study. Specifically, crowd density (*Density*) for each match was calculated by dividing the crowd size for each match by the maximum crowd size at the stadium during that season. Stadium capacity information was obtained from mlssoccer.com (2018). For matches played in non-MLS stadia, seating capacity information was obtained from each stadium's website.

Data were also collected regarding the differential in quality between the visiting and home teams for each game at the time the game was played (*Quality*). A Pythagorean formula developed by Hamilton (2011) was employed to calculate the quality of the home and visiting teams for each match. The Pythagorean formula (1) was first developed by Bill James (1988) to predict the win percentage of a baseball team from the observed number of runs scored (*RS*) and runs allowed (*RA*) during the season. The formula (2) developed by Hamilton (2011) was adapted for soccer to account for the probability of a draw, which occurs in a nontrivial proportion of soccer matches. This modified formula estimates points won per game based on the number of goals for (*GF*) and goals against (*GA*), which accommodates leagues, such as MLS, that award points for wins and draws (currently defined as three points per win and one point per draw). The application of Hamilton's formula to results of domestic soccer leagues in Europe, Asia, and the Americas demonstrates congruity between goal statistics and league records for most teams.

$$\frac{\hat{W}}{M} = \frac{RS_{obs}^{\gamma}}{RS_{obs}^{\gamma} + RA_{obs}^{\gamma}} \tag{1}$$

Based on the results of Hamilton's (2011) research, the "universal" Pythagorean exponent (γ) was set to 1.7 when applied to various domestic soccer leagues around the world, including MLS. The validation of the modified Pythagorean formula in MLS justifies its use in the current study to measure team quality. Upon calculating the points won per game for both the visiting and home teams using Hamilton's formula, the difference was calculated to obtain the quality differential. If the quality differential was positive, the visiting team had a higher estimated

point total (and thus, a stronger team) than the home team, and if the differential was negative, the home team had a higher estimated point total than the away team.

$$Pt\% = \frac{\mathrm{GF}^{\gamma}}{GF^{\gamma}+GA^{\gamma}} \quad (2)$$

To specify the travel effects on the performance outcomes of MLS teams, the following data were collected from their travel itineraries: the number of days between the travel day and match day (*Days*), the number of hours travelled (*Hours*), and the number of time zones crossed by the visiting team before a match (*Time Zones*). Unfortunately, the number of hours travelled for charter flights was not available in the itineraries provided. To compensate, the website https://flight-time-calculator.com/ was used to measure the duration of charter flights. This tool calculates the distance between two points on earth based on the 'haversine formula,' as the earth is an ellipsoid rather than a sphere. The calculated charter flight times are estimates because it is not possible to know all circumstances or the actual flight routes taken by teams. Departure and arrival airports are matched to a world-wide time zone map on https://flighttime-calculator.com.[1]

In addition to the variables explained above, the following data were coded from the travel itineraries in the form of dummy variables: whether the visiting team travelled by charter (*Charter*), whether a team incurred a connection while travelling commercially (*Connection*), and the direction of travel by the visiting team before a match. Specifically, the directionality of team travel was coded as eastward (*East*) or westward (*West*). Eastward travel was represented by the dummy variables of one (1) to represent eastward and zero (0) to represent westward, southward, or northward travel. Westward travel was represented by the dummy variables of one (1) to represent westward and zero (0) to represent eastward, northward, or southward travel. Northward and southward travel were not coded separately because teams travelling in these directions do not typically travel across time zones, and when they do cross a time zone, it was captured in the *East* or *West* dummy variables. When coding for the direction of team travel, we calculated the difference in the degrees of latitude and/or longitude from the point of origin to the destination. The direction with the greatest degree of difference was coded as the primary travel direction.

Data Analyses

A univariate chi-square test was employed to determine whether a home advantage existed in MLS during the timeframe of the study. An ordinal (multinomial) regression model was then carried out to determine the amount of explained variance in the outcome variable (visiting team's win/loss/draw) attributable to the main effects of the predictor variables (i.e., *Days, Hours, Time Zones, Charter, Con-*

[1]While the map used on this website does not account for daylight-savings, a review of the game data revealed only one instance where a team travelled from a location where daylight savings is not observed and was accounted for in the calculation.

nection, East and *West*). To help isolate the effects of the abovementioned travel factors, *Density* and *Quality* were used as control variables in the regression model. Thereafter, odds ratio calculations were performed to determine the likelihood of game outcomes being dependent on the predictor variables.

Results

Of the 1,054 MLS games that were played in MLS during the 2015 through 2017 seasons, only 978 were included in the analysis. In total, 68 games were excluded because the visiting team did not employ airline travel. Specifically, 58 games were excluded because the visiting team travelled to the game by bus and 10 games by train. None of these instances necessitated travel across time zones. A further 8 games were excluded because no definitive travel information could be established. These 978 MLS games represent 93% of all games played over the three seasons included in the analysis (see Table 1).

Table 1

Visiting Team Travel Mode Summary by Season (2015-2017)

Travel Mode	Season			Total	Percent
	2015	2016	2017		
Commercial Direct	283	282	325	890	84.4
Commercial Connection	18	22	10	50	4.7
Charter	15	11	12	38	3.6
Bus	20	16	22	58	5.5
Train	3	4	3	10	0.9
Missing	1	5	2	8	0.8

The univariate chi-square analysis revealed a home advantage in MLS, χ^2 (df = 1, n = 978) = 175.07, $p < .001$, with the home team winning 53.1% of the games (see Table 2). This home advantage for MLS is comparable to the home winning percentages for other team sports, as reported by Jamieson (2010). However, if drawn matches are excluded from the analysis, the home team winning percentage increases from 53.1% to 71.7%, which is slightly higher than reported for soccer in reviews by Courneya and Carron (1992) and Jamieson (2010).

Table 2

Home Winning Percentage in Major League Soccer

Result	Frequency	Percent
Win	519	53.1*
Tie	254	26.0
Loss	205	21.0

* $p < .001$

Multinomial Logistic Regression Analysis

Two control variables (i.e., *Density* and *Quality*) and seven predictors (i.e., *Days, Hours, Time Zones, Charter, Connection, East,* and *West*) were used in a multinomial logistic regression to examine the effect of travel on match outcome (i.e., *win, draw,* or *loss*). This analysis revealed a positive effect of a *Connection* during a commercial flight on the likelihood of the visiting team losing its match when compared to a drawn match ($p = 0.023$). A positive effect was also revealed when the visiting team was travelling *East* on the likelihood of both losing ($p = 0.070$) and winning its match when compared to a drawn match ($p = 0.061$) (see Table 3).

Table 3

Summary of Multinomial Logistic Regression Results

Away Result[a]	Predictor	*B*	*SE*	*Wald*	*p*	*Exp(B)*	*95% CI for Exp(B)*
Loss Intercept		.912	.415	4.839	.028		
	Density	-.175	.351	.250	.617	.839	.422-1.670
	Quality	.488	.359	1.852	.174	1.629	.807-3.291
	Days	-.003	.186	.000	.987	.997	.692-1.436
	Hours	-.131	.124	1.105	.293	.877	.687-1.120
	Time zones	.037	.196	.035	.851	1.038	.706-1.524
	Commercial Charter	.163	.410	.159	.690	1.178	.527-2.629
	Commercial Connection	1.185	.520	5.191	.023	3.272	1.180-9.071
	East	.489	.270	3.277	.070	1.631	.960-2.769
	West	.291	.251	1.345	.246	1.338	.818-2.190
Win Intercept		-.074	.507	.021	.884		
	Density	-.109	.424	.066	.798	.897	.391-2.059
	Quality	.169	.438	.149	.699	1.184	.502-2.793
	Days	-.048	.230	.044	.834	.953	.607-1.495
	Hours	-.097	.152	.409	.523	.907	.673-1.223
	Time zones	.022	.239	.008	.927	1.022	.639-1.635
	Commercial Charter	-.209	.543	.148	.700	.811	.280-2.351
	Commercial Connection	.902	.612	2.176	.140	2.465	.743-8.176
	East	.611	.326	3.503	.061	1.842	.972-3.491
	West	.172	.310	.306	.580	1.187	.646-2.182

Notes. Nagelkerke Pseudo $R^2 = 0.021$; *SE* = Standard Error. *95% CI* = 95% Confidence Interval. [a] Tie is the reference category.

Cross-tabulations and Odds Ratios

To determine the relationship between travel factors and match outcomes, cross-tabulations between *Connection* and *East* on match outcome for the visiting team were performed. Odds ratio calculations were derived from these cross-tabulations. As a soccer match can have three possible outcomes (i.e., win, draw, or loss), odds ratios for each variable were divided into three separate calculations comparing the outcomes of a win to a loss, a draw to a loss, and a draw to a win.

When the visiting team incurred a connection during its travel, the odds ratio comparing a loss to a win was 1.16:1, meaning it was more likely to lose than win. The odds ratio comparing a loss to a draw where a connection was involved in the flight was 2.32:1, meaning that the visiting team was 2.32 times more likely to lose than draw. Finally, the odds ratio comparing a draw to a win where a connection was involved in the flight was 1:2, meaning that the visiting team was twice as likely to win as draw (see Table 4).

Table 4

Visiting Team Result x Connection Cross-Tabulation

Result	Connection	Direct/Charter	Odds Ratio
Win	11	194	Tie: 2:1 Loss: 1:1.16
Tie	7	247	Win: 1:2 Loss: 1:2.32
Loss	32	487	Tie: 2.32:1 Win: 1.16:1

The odds ratio comparing a win to a loss when the visiting team traveled east was 1.83:1, meaning that the visiting team was 1.83 times more likely to win than lose. The odds ratio comparing a loss to a draw when the visiting team is traveling east was 1.42:1, meaning that the visiting team was 1.42 times more likely to lose than draw. Finally, the odds ratio comparing a draw to a win when the visiting team was traveling east was 1.69:1, meaning that the visiting team was 1.69 times more likely to win than draw (see Table 5).

Table 5

Visiting Team Result x East Cross-Tabulation

Result	East	N/S/W	Odds Ratio
Win	82	123	Tie: 1.69:1 Loss: 1.83:1
Tie	72	182	Win: 1:1.69 Loss: 1:1.42
Loss	187	332	Tie: 1.42:1 Win: 1:1.83

Discussion

The current study examined the effect of travel factors on visiting team performance in MLS. Select travel factors appear to affect the performance of visiting teams based on the analysis of three seasons of MLS data. A clear home advantage is reflected in the results, as evidenced from the univariate chi-square analysis, which is supported by the descriptive data presented in Table 2. The results also revealed a negative effect of a connecting flight by the visiting team on match outcomes, supporting hypothesis H_5. Specifically, the odds ratios revealed an increase in the likelihood of a loss when compared to a drawn match. It is common for soccer teams to adjust their tactics when playing matches on the road. For instance, Tucker et al. (2005) examined the influence of game location on performance from technical and tactical perspectives. These authors found that the home environment and social support from the crowd was associated with an increased aggressive response by the home team, which was manifested by an offensive playing style. In response, coaches of visiting teams often adopted a defensive style to counteract the impact of the home crowd. Consequently, visiting teams exerted more pressure within their defensive third of the pitch to force turnovers and initiate counterattacks. In addition, visiting teams performed more goal kicks and clearances than when they played at home (Tucker et al., 2005).

Travel effects such as jet lag also appear to influence match outcomes of visiting teams in MLS. Notably, their chances of winning or losing matches increased when traveling east when compared to a drawn match. These results support H_6 and are partially consistent with previous findings that the home team could expect to perform better than usual when the visiting team completed eastward travel (Jehue et al., 1993; Recht et al., 1995). In contrast, Goumas (2014) found that directionality was not shown to be associated with the home advantage. However, Goumas did provide support for jet lag being a cause of poor visiting team performance when travelling long distances. These equivocal findings could be due to differences in how researchers operationalize and capture the various travel factors.

The number of days between travel and the match, the number of hours traveled, the number of time zones crossed when travelling, and travelling by chartered flights were not critical predictors of match outcomes in this study. Therefore, H_1, H_2, H_3, and H_4 were not supported by the results. The impact of the number of hours travelled on match outcomes was in line with Goumas (2014), who found no positive effect of distance travelled on the home advantage. Still, Goumas operationalized distance travelled using the latitude/longitude coordinates of each team's home venue, rather than travel duration in hours. The results from Goumas and the current study point to an overall lack of support for either distance or hours travelled as influential factors of match outcomes. In relation to crossing time zones before a match, the findings of the current study contradict Goumas, who reported a positive relationship between the home advantage in Australian soccer and the number of time zones crossed by the visiting team. The poor pre-

dictive ability of these travel related variables may be due to the variance attributable to travel connections, eastward travel directionality, or numerous other factors, including the critical psychological or behavior states of the competitors, coaches, and/or officials cancelling out their effect.

Managerial Implications

There are several practical applications that can be drawn from the results of the current study. Primarily, the findings demonstrate the importance of reducing the amount of jet lag that is experienced by MLS teams and alleviate these symptoms. It is apparent that much could be gained from travel management programs designed to mitigate the effects of air travel on performance (Goumas, 2014). Preflight adaptations such as altering the volume and intensity of training sessions, adjusting the timing of training sessions to the destination time zone, and ensuring that athletes have sufficient sleep prior to travelling are suggested methods of lessening the effects of jet lag. Reducing the cost associated with jet lag for eastward travel may be achieved by adjusting the sleep-wake cycle to the destination time zone by advancing the sleep time with bright light upon rising for three days before the flight (Burgess et al., 2003). Flights can also be arranged so that visiting teams arrive well in advance of their matches in order to acclimate. Sleeping on flights should also be avoided unless it is night by destination time (Waterhouse et al., 1997). The harmful effects of jet lag also depend on the duration of the stay. If the stay is less than three days, it is recommended that players stay on their home time and attempt to arrange sleep and engagements to coincide. Pharmacological interventions, such as melatonin, have also been used to prevent and treat jet lag (Waterhouse et al., 1997).

These findings are of particular importance for MLS teams located on the west coast, such as the Vancouver Whitecaps, because they play more away games after eastward travel than other teams. While the performance decrements described in this study may seem small in isolation, their consequences for MLS may be substantial. Over the course of a given MLS season, the difference between a chartered flight and a commercial flight with a connection could mean the difference between making the playoffs or not. For instance, the Vancouver Canucks of the National Hockey League are the lone team in the Pacific Northwest geographical region and often find themselves travelling across multiple time zones for matches against their opponents. Like the Vancouver Whitecaps, the demands of the Canucks travel schedule led former General Manager Mike Gillis to contract a sleep consulting firm to help the team overcome the rigors of fatigue related to travel and time zone changes (Rosen, 2011). This firm monitored the sleeping habits of players and provided data to the Canucks' medical staff to determine the ideal times for the team to fly and practice. This travel management program contributed to the Canucks having the best road record in the league during the 2011 season, in which they reached the Stanley Cup Finals (Rosen, 2011). This example provides evidence for the benefit of fatigue monitoring and travel management systems by professional sport teams located along the west coast.

Although the findings of the present study provide limited support for the implementation of chartered flights in place of commercial travel, there is support for the use of chartered flights when no direct commercial alternative is available. The practical utility of these findings came into focus during the recent negotiations of the new CBA between MLS and the MLSPA. This five-year agreement, reached prior to the 2020 season, includes a substantial increase in the number of charter flights for MLS clubs. Specifically, clubs are *required* to use charter flights for eight legs of travel during the 2020 regular season, where it will expand to 16 legs for the 2024 season. In the previous CBA, clubs had the *option* to charter up to four legs per season. In addition, clubs will be required to use charter air travel for all MLS Cup Playoff matches and (CONCACAF) Champions League games involving international travel (mlssoccer.com, 2020). This new agreement highlights that, although the results of this study are mixed, the practical implications remain noteworthy.

There are several limitations to consider in the present study. The first limitation is the relatively small number of chartered flights and commercial flights with connections compared to the number of direct commercial flights. Of the 978 travel itineraries, 50 (4.7%) of the commercial flights included a connection and 38 (3.6%) trips were made by chartered air travel. A second limitation is the difficulty in controlling for other factors that influence soccer match outcomes. Failing to control for other factors, such as referee bias, coaching turnover, changes in elevation, and critical psychological states may have provided further specificity on the impact of the travel factors of interest. A third limitation can be attributed to accurate flight time information not being available for chartered flights in the itineraries provided by MLS. This is because teams traveling by chartered flights are responsible for arranging the flights themselves and are not required to disclose their flight details to the league. The last limitation pertains to the generalizability of the findings beyond MLS. Teams in other North American professional sport leagues face similar travel demands. However, it is inappropriate to compare these findings with these other leagues because they play much more frequently. Although these findings may be applicable to National Football League (NFL) teams, given the games occur with the same approximate frequency, there are many other rule factors that could differentially influence match outcomes for NFL teams.

Conclusion

The purpose of the current study was to examine the effects of travel on match outcomes for the visiting team in MLS from 2015 through 2017. The study revealed negative effects for incurring a connection and completing eastward travel on the match outcomes for visiting teams. Specifically, the results show that a connection during a commercial flight and eastward travel affects the subsequent performance of visiting teams. The current study provides insight into how different modes of air travel can influence performance and clarifies some of the conditions

under which visiting teams should change or adapt their strategies to achieve favorable match outcomes.

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