JOURNAL OF ISSUES IN INTERCOLLEGIATE ATHLETICS

Switching Schools: Examining the Networks, Antecedents, and On-Court Outcomes of NCAA Division I Men's Basketball Transfers

N. David Pifer
Texas Tech University

Matt R. Huml
University of Cincinnati

Akira Asada
Texas Tech University

Prior research has indicated that athletic concerns remain at the forefront of Division I athletes' enrollment and transfer decisions, yet the athletic circumstances and outcomes surrounding these transfers remain under-analyzed in the broader empirical literature. As such, this study applied a social network analysis and accompanying hypothesis tests to a dataset containing approximately 1,200 Division I men's basketball transfers in order to identify trends in the market and examine whether transfers have benefited players and teams on the court. The results depict a market characterized by low density and low reciprocity as schools were involved in an average of just 0.7 transfers per season from 2012-13 to 2016-17. However, transfers occurred more frequently during coaching changes, between non-Power Five programs, and between schools in the same state. In terms of performance and opportunity changes, transfer players averaged significantly more games, minutes, usage rates, and win shares in the seasons following a transfer. They also averaged more win shares and win shares per 40 minutes than freshmen of the same position.

Keywords: college sports, college athletes, mobility, opportunity

The National Collegiate Athletic Association (NCAA) is a member-led sport organization consisting of approximately 1,117 colleges and universities competing in 100 conferences across three divisions. Nearly half a million college athletes and 19,750 teams participate in the NCAA's 24 official sports (NCAA, 2019a), with athletes in the top two divisions (Division I and II) typically competing in exchange for athletic scholarships and other forms of financial aid that can be applied to tuition and living expenses while enrolled at their respective institutions. As of 2017, the NCAA was generating close to $1.1 billion in annual revenues. Division I Men's Basketball Championship television/marketing rights ($821.4 million) and ticket sales to NCAA championship events ($129.4 million) accounted for a majority of these revenues, with membership dues and other revenue streams comprising the remainder (NCAA, 2019b).

Two Division I sports, football and men's basketball, consistently have programs that are self-sustaining from a financial perspective. These so-called "revenue sports" are the recipients of increased awareness and investment from fans and alumni, with some of the top programs bringing in approximately $148 million a year in football (Smith, 2018) and $43 million a year in basketball (Wiggins, 2018). Increasing revenues, coupled with rising salaries for coaches and administrators, have led some to question the NCAA's model for amateurism and propose that college athletes be the recipients of additional benefits. One of the recommended benefits is that of increased transfer mobility, as opponents of the current system argue that college athletes should have greater freedom and power when deciding to switch collegiate athletic programs (Meyer, 2004).

For years, the NCAA and its members have generally required football and men's basketball transfers to get permission from their current institution before making a switch, while also forcing them to sit out a season if transferring to another Division I program of the same sport. However, the NCAA and some of its member conferences have undergone a series of rule changes in recent seasons that have removed or reduced regulations that had previously deterred college athletes from transferring between Division I schools. For example, the Southeastern Conference (SEC) revised its policies in the summer of 2018 to allow graduate transfers (i.e., players who had already completed undergraduate degrees at their current institutions) to transfer within the conference and play immediately, abolishing a prior limitation that had required them to sit out a season before regaining eligibility. The conference also passed legislation allowing players enrolled at SEC schools undergoing NCAA-mandated postseason bans to transfer without having to sit out a season (Southeastern Conference, 2019).

In a more comprehensive move, the NCAA decided in October 2018 that Division I athletes could transfer to a different school and receive scholarships without asking their current school for permission to make the switch. This "notification-of-transfer" model allows college athletes to freely inform their current school of their desire to transfer and enter their name into a national transfer database. This public portal, which was entered by 1,021 Division I men's basketball players in 2019-20 (NCAA, 2021), alerts prospective coaches to the athlete's desire to transfer and gives them permission to make contact. According to an official NCAA news release (Hosick, 2018),

> The previous transfer rule, which required student-athletes to get permission from their current school to contact another school before they can receive a scholarship after

> transfer, was intended to discourage coaches from recruiting student-athletes from other Division I schools. The rule change ends the controversial practice in which some coaches or administrators would prevent students from having contact with specific schools. Conferences, however, still can make rules that are more restrictive than the national rule (para. 4).

This outcome was the result of the NCAA's Transfer Working Group, which had been aiming to detach a college athlete's pursuit of transferring to a different school from the process of receiving a scholarship at the new college or university. Recent reports have also mentioned that the NCAA is exploring the possibility of allowing athletes to transfer during the summer and gain immediate eligibility at a new school if there is a head coaching change before the first day of fall classes (Associated Press, 2018). Even more recently, both the Big Ten and the Atlantic Coast Conference (ACC) released public statements saying they were supportive of allowing college athletes, regardless of sport, to transfer one time without having to sit out for a season (West, 2020).

Analyses on the factors behind college athlete transfers, and their eventual outcomes, gain importance in the midst of loosening transfer restrictions. Prior research has explored the various motivations behind athletes' decisions to transfer, finding such issues as race (Harper, 2009; Cooper & Hawkins, 2014), legal rights (May & Seifried, 2012), and individual struggle (Burgess & Cisneros, 2018) to influence the process. Yet, it is the athletic motivations that tend to feature most prominently among prospective Division I transfers, with prior studies alluding to the importance of athletic factors (e.g., playing time, teammate and coach relationships, athletic scholarship offers, and increased visibility) in athletes' decisions to choose one school over another (Burgess & Cisneros, 2018; Flowers, Luzynski, & Zamani-Gallaher, 2014). However, even with Division I transfers generally occurring for athletic reasons, the athletic outcomes of these moves have seldom been the focus of prior research. If playing opportunities and athletic performances actually increase following a transfer, such information might be helpful to athletes making career-altering decisions with limited support (Flowers et al., 2014). This gap in the literature is even more surprising given its potential relevance to the colleges and universities that benefit financially from the success of their revenue sport programs (Pope & Pope, 2009; Pope & Pope, 2014; Rhoads & Gerking, 2000). Transfer athletes have the potential to provide college teams with an additional source of talent beyond the high school graduates that are typically recruited, meaning transfers' abilities to generate wins should be compared to those of alternative talent sources.

Therefore, the purpose of this study was two-fold: first, it examined patterns of movement in the transfer market for NCAA Division I men's basketball players and explored whether certain factors tend to facilitate these transfers. Second, it tested whether transfers generally lead to increases in opportunity and performance on the court, and whether there are significant differences in the statistical performances of transfer players and freshmen of the same position. Division I basketball, in many ways, is the ideal setting for this analysis, as transfers between Division I men's basketball programs rose between 2004 and 2017 at a rate that was high relative to most other Division I sports (NCAA, 2018). Furthermore, approximately 40% of college athletes who signed with Division I men's basketball teams directly out of high school during this time ended up transferring to another institution by the end of their sophomore years (NCAA, 2018). Combine these transfer statistics with the recent rule changes and the hundreds of millions of dollars that are generated and redistributed by the

NCAA Division I Men's Basketball Championship (March Madness) to high-performing teams and conferences each year (Ingold & Pearce, 2015), and the rationales for examining the flow of this transfer market and its effects on performance are readily justified.

Background & Literature Review

The National Letter of Intent

Even in the midst of various deregulations and loosened restrictions, the overall NCAA transfer market has remained limited in its capacity to facilitate college athlete mobility over the past few years. This is due in part to the National Letter of Intent (NLI), the contractual document indicating a college athlete's commitment to play athletics at an NCAA Division I or II program in exchange for an athletic scholarship. Upon signing an NLI, a college athlete is bound to their chosen school. Unless granted official release from the NLI, a signee who wants to switch schools must generally sit out a year or play a year of junior college or NAIA ball before regaining eligibility to play at another NCAA institution. The NLI was created by the Collegiate Commissioner's Association to prevent either party from backing out of its initial agreement (NCSA, 2020); however, these arrangements have drawn criticism from those who argue that NLIs allow universities to hold an uneven amount of power over college athletes. Whereas athletic programs have traditionally been able to pull a scholarship at the end of a season without penalty, certain college athletes who want to transfer must risk a year of their college career in order to continue competing in the NCAA's top divisions.

In many ways, an NLI can be compared to the post-employment non-compete clauses that are placed in workers' contracts across other industries. A non-compete agreement specifies a period of time during which a former employee will not be hirable by competing firms. These clauses are written into employees' contracts to enforce loyalty among workers who might otherwise be tempted to change jobs and take valuable information with them (Marx, 2011). Becker's (1962) theory of human capital implies that workers are inseparable from the knowledge and skills they develop; thus, post-employment non-compete agreements are designed to prevent workers from easily taking their knowledge and skills—many of which may have been developed and reinforced by their current employer—to other firms in an industry. Though the exact definition of a college athlete has traditionally centered on a model of amateurism rather than professionalism, NCAA Division I men's basketball players are highly skilled, specialized individuals serving as key inputs to an industry that generates millions of dollars in revenue each year. They are also individuals with human capital, offering their basketball knowledge and skills to teams competing against one another for regular season and postseason wins. When one further considers that some amount of college athlete capital is likely firm-specific as the result of high-dollar coaching and training, the scenario logically positions itself as one in which firms and workers clash over the workers' property rights. As such, the effects that firm or industry restrictions have on the mobility of working professionals in other settings can be translated to college athletes and teams competing in Division I athletics.

The Market for NCAA Men's Basketball Transfers

The market for NCAA Division I men's basketball transfers remains under-analyzed in the broader realm of academic research. Due in part to the extant restrictions and limited

availability of transfer-related data, many of the analyses that are conducted flow through the NCAA's in-house research consortium. Recent reports from this group have shown that the rate of transfers remained relatively steady in Division I men's basketball from 2017-2020, staying within a range of 648 to 704 athletes each year (NCAA, 2021). In 2020, Division I to Division I transfers represented 63% of all transfers, with graduate transfers making up a third of the players staying at this level. Roughly 16% of Division I transfers during this timeframe were what the NCAA labeled as "up transfers" involving moves by athletes to more prestigious programs (e.g., from programs in non-major conferences to programs in major conferences). Conversely, about 23% were "down transfers" and nearly 61% were "lateral transfers" to programs of a similar quality.

With the NCAA classifying the majority of these transfers as lateral or down transfers, the possibility is raised that the NLI and its associated transfer restrictions are limiting the supply of specialized labor at the top level of the industry by asserting property rights over players' skills. Marx, Singh, and Fleming (2015) showed how non-sport workers were more likely to emigrate to states that did not enforce non-competes, signifying a "brain drain" of sorts from the states that enforced them. The restrictions drove away talented individuals with greater human capital and retained those who were less productive, implying that businesses enforcing non-competes risked suffering net losses in talent as their personnel losses were not offset by a replenishing flow of talent. Non-competes also raise the concern that barriers to exit replace incentives to stay (Marx, 2011), an issue that could manifest itself among college athletes through a lack of motivation or effort. If disadvantaged in their current settings, their lack of effort could bleed through to the teams that are using a scholarship on them or attempting to play them in the midst of their struggles. Workers subject to non-competes are further disadvantaged at the individual level because they "risk having to leave their occupations when they leave their jobs and may have to take career detours" (Marx, 2011, p. 707), an occurrence not too dissimilar from NCAA college athletes making "down transfers" or risking a year of eligibility if leaving their current institution without release.

However, aside from the NCAA's limited notes on transfer direction and the theories developed by research in other industries, little is known about the networks linking these transfers at the Division I level. Therefore, we drew on prior literature in the areas of college athlete recruitment and retention to develop examinable rationales for patterns that may exist in the transfer network for NCAA Division I men's basketball players. Johnson, Wessel, and Pierce (2013), for example, showed that Division I freshmen across a variety of sports were more likely to drop out if they were further from home and competing in high-pressure revenue sports like men's basketball. This means that proximity to a certain zone of familiarity is likely to play a role in these athletes' decisions to stay or leave while also serving as a possible cause for more frequent transfers to nearby schools. Rules permitting, such a phenomenon may also be observable through an increased frequency of transfers between schools in the same conference. This might partially explain the NCAA's (2021) persistent findings of lateral moves as athletes look to better their circumstances while remaining in familiar territories.

Continuing, the NCAA research aligning conference prestige with patterns in player movement alludes to the possibility that certain types of schools may experience more in-transfers and out-transfers than others. Prior research shows that increased visibility and playing opportunities influence junior college transfers' decisions to enroll at Division I institutions (Burgess & Cisneros, 2018), and that the athletic reputation and head coach of a program help determine the school choices of college-bound athletes (Flowers et al., 2014; Letawsky,

Schneider, Pedersen, & Palmer, 2003). It is for this reason that Division I athletes struggle through head coaching changes at their respective programs as their trust, strength, and future outlooks are challenged (Pate, Stokowski, & Hardin, 2011). This means that potential disruptions brought about by conference and head coaching changes could affect the number of transfers flowing in and out of certain programs as players maneuver to the situations that provide them with the optimal athletic opportunity. Such assumptions help formulate a hypothetical picture of the patterns that could emerge in the network of NCAA Division I men's basketball transfers:

Hypothesis 1 (H_1): Schools will be involved in a higher number of transfers if they change conferences.

Hypothesis 2 (H_2): Schools will be involved in a higher number of transfers if they change head coaches.

Hypothesis 3 (H_3): Transfers are more likely to occur between schools in the same state.

Hypothesis 4 (H_4): Transfers are more likely to occur between schools in the same conference.

The Athletic Outcomes of NCAA Men's Basketball Transfers

Prior studies have empirically examined the pre-and-post transfer experiences of college athletes, but often from academic and sociological perspectives. These studies have looked at transfer athletes integrating on new college campuses, Black athletes' transfer experiences, the effects of changing environments, and the transitions from community colleges to four-year institutions (Burgess & Cisneros, 2018; Cooper & Hawkins, 2014; Flowers et al., 2014; Harper, 2009; Le Crom, Warren, Clark, Marolla, & Gerber, 2009). Burgess and Cisneros (2018) reported on the traditional transfer experience of college athletes transitioning from two-year colleges to four-year universities. They discussed how athletes' decisions to attend two-year schools were heavily influenced by a desire to continue their athletic careers, preferably with Division I institutions. Athletes in this study reported on the stressful experiences of going through the transfer process and having to find a "second home" for their athletic career. Flowers et al. (2014) interviewed a small sample of male, Division I transfer athletes, finding that athletic motivations spurred their transfers, and NCAA rules forced them to attend transitional two-year institutions in order to make degree progress and remain athletically eligible. They further found that these athletes were heavily self-reliant and dependent on very narrow networks of support, features that left them ignorant to the consequences surrounding their transfer decisions.

With prior research suggesting that athletic factors play a pivotal role in Division I athletes' decisions to switch programs (Burgess & Cisneros, 2018; Flowers et al., 2014), it is important to examine two practical elements that surround these players' decisions; these are, (a) whether transfers receive further playing opportunities with a new program, and (b) whether transfers' athletic performances improve following a switch. For the individual athlete, increased opportunities are the starting point if they simply enjoy playing the sport, want to earn an athletic scholarship, or hope to continue their athletic career at the professional level. Prior research suggests that these are motivating factors behind Division I transfers (Flowers et al., 2014), and

in a setting where just 4.2% of draft eligible NCAA Division I men's basketball players were selected in the 2019 National Basketball Association (NBA) Draft (NCAA, 2020a), players need the exposure afforded by increased playing time to attract professional scouts and contract offers. In basketball, playing opportunities are easily measured through the number of games and minutes played, as well as the more standardized minutes-per-game metric. If players are switching programs in order to receive more playing time, then the number of games they appear in, the number of minutes they play, and the minutes they average per game should all improve over the seasons before and after a transfer. As such, we developed the following hypotheses for testing as they relate to changes in transfers' opportunities:

Hypothesis 5 (H_5): Players will appear in more *games* (*G*) after transferring programs.

Hypothesis 6 (H_6): Players will play more *total minutes* (*MP*) after transferring programs.

Hypothesis 7 (H_7): Players will average more *minutes per game* (*MP/G*) after transferring programs.

Even so, increased opportunity for some players may mean more than simply appearing in more minutes on the floor. It could imply that players want to be featured more prominently in a team's offensive game plan. *Usage percentage*, sometimes referred to as *usage rate*, is an estimate of the percentage of team plays used by a player while on the court. In essence, it shows how much of the team's offensive load was shouldered by a player while on the floor, making for a more precise estimate of player involvement. It is calculated via the following formula:

$$USG\% = 100 * ((FGA + 0.44 * FTA + TOV) * (TmMP/5))/(MP * (TmFGA + 0.44 * TmFTA + TmTOV)),$$

where usage percentage (*USG%*) is estimated using a player's individual field goal attempts (*FGA*), free throw attempts (*FTA*), turnovers (*TOV*), and minutes played (*MP*), as well as the team's (*Tm*) statistics in those same categories. As such, we theorize an additional hypothesis related to transfer usage within a new program:

Hypothesis 8 (H_8): Players will have higher *usage percentages* (*USG%*) after transferring programs.

In addition to increased opportunity and usage, players may also transfer to schools that enhance their personal playing statistics. Flowers et al. (2014) highlighted the importance that transfers place on head coaches and teammates when making their transfer decisions, so by aligning with programs that are more suitable to their skillset or style of play, players may be able to elevate their performances to a new level and achieve greater athletic success during or after college. Though basketball has numerous metrics—field goal percentage, turnovers, rebounds, etc.—that can capture changes in player performance following a transfer, *win shares* offer a more holistic measure of basketball performance. A win share is a statistic that approximates the number of wins that a player contributes to their team over the course of a season. Its utility among researchers stems from its ability to condense a player's individual

offensive and defensive performances into a single number that corresponds to the number of wins or losses contributed. Saying that a player has a win share of 1.0 is equivalent to saying the player's performances added one win to a team's record. Win shares are calculated by summing a player's offensive and defensive win shares together.

Offensive win shares are calculated by the following equation:

$$Offensive\ Win\ Shares_{it} = \frac{PtsProd_{it} - 0.875 * LgPPP_t * OffPoss_{it}}{0.5 * LgPPG_t * (TmPace_t / LgPace_t)},$$

where the offensive win shares of player *i* in season *t* are calculated using the number of points produced (*PtsProd*) by the player, the league average for points per possession that season ($LgPPP_t$), the number of offensive possessions the player had that season ($OffPoss_{it}$), the league average for points per game (*LgPPG*) in season *t*, and a ratio of his team's pace (*TmPace*) to the league's pace (*LgPace*) during season *t*. A player's defensive win shares are calculated as:

$$Defensive\ Win\ Shares_{it} = \frac{(MinsPlyd_{it} / TotTmMins_t) * TmDefPoss_t * (1.125 * (LgPPP_t - ((PlyrDRTG_{it}) / 100))}{0.5 * LgPPG_t * ((TmPace_t) / (LgPace_t))},$$

where the defensive win shares of player *i* in season *t* are calculated using the total number of minutes they played that season (*MinsPlyd*), the total number of minutes their team played (*TotTmMins*), the number of possessions their team faced on defense (*TmDefPoss*), the league average for points per possession that season (*LgPPP*), the player's individual defensive rating (*PlyrDRTG*), the league average for points per game during season *t* (*LgPPG*), and a ratio of the team's pace (*TmPace*) to the league's average pace (*LgPace*) for that season. Additional information on these equations and their featured terms can be found by visiting *www.sports-reference.com/cbb* (2019) or reading *Basketball on Paper* by Oliver (2004).

Although the win share calculation controls for pace of play, it is still a count stat at its core. As such, players who appear in more minutes will likely accrue more win shares. Therefore, in an effort to look more closely at win shares through the lens of player efficiency, statisticians have begun looking at *win shares per 40 minutes* (i.e., the number of minutes in a regulation NCAA Division I men's basketball game). This metric is simply calculated by taking a player's win share total, dividing it by the number of minutes played, and multiplying the resulting value by 40. Taken together, these metrics mean we can analyze changes in player performance more acutely through the following hypotheses:

Hypothesis 9 (H_9): Players will have higher *win shares* (*WS*) after transferring programs.

Hypothesis10 (H_{10}): Players will have higher *win shares per 40 minutes* (*WS/40*) after transferring.

Furthermore, as a statistic denominated in wins, win shares are capable of showing how teams can benefit from the addition of transfer athletes. Athletic achievement is associated with a number of financial benefits for Division I institutions, with prior research showing that success in Division I men's basketball can lead to increases in the quantity of applications (Pope & Pope,

2009), a heightened awareness among prospective students (Pope & Pope, 2014), and increased donations from alumni (Rhoads & Gerking, 2000). The NCAA's basketball fund, which awards monetary "units" to teams' conferences for progressing through various stages of March Madness, further links athletic performance with financial reward at the institutional level (Ingold & Pearce, 2015). Therefore, schools would be wise to assess the availability and quality of transfer athletes, and whether they can help men's basketball teams achieve on-court success.

One way of seeing whether transfers provide advantages over other players would be to compare their performances to those of similar, replacement level players. Freshman players of the same position represent a natural supply of alternative talent in large part because they are the ones competing with transfers for limited scholarship offers; that is, coaches looking to reinforce their rosters can choose to extend grants-in-aid to incoming freshmen or college transfers. These two sources of talent have also been juxtaposed against one another in the past. In the mid-1990s, the NCAA increased the number of core courses required for high school athletes to qualify for eligibility (NCAA, 2019a). This change made it more difficult for high school athletes to be eligible as college freshmen but did not affect the eligibility of transfer athletes who are assessed on their pre-established college GPAs. As a result, NCAA universities started to see an increase in transfer athletes as coaches became more confident of their eligibility (Price, 2010). More recently, the NCAA has started to rescind some of the restrictions that had been keeping Division I athletes from transferring for athletic reasons. Athletes who complete their baccalaureate degrees are now allowed to transfer to another school to complete their eligibility without restrictions from their host institution (NCAA, 2019c). Coupled with the increased graduation rates of NCAA athletes following the passage of the Graduate Success Rate (GSR) and Academic Progress Rate (APR), coaches now have an opportunity to recruit more established college athletes to their program and lessen their dependence on building a roster with freshmen. Going further, the NCAA has begun easing some of its transfer restrictions in recent years, creating the transfer portal and accepting athlete appeals for immediate eligibility following the termination of a head coach (Associated Press, 2018; Hersch, 2012). This has amplified the market for transfer athletes, creating a second, competing market from which college coaches can obtain playing talent (Cali, 2014). We therefore developed the following hypotheses to explore whether transfer athletes generate more wins for teams than comparable freshmen:

Hypothesis 11 (H_{11}): On average, transfer players will have higher *win shares* (*WS*) than freshmen of the same position.

Hypothesis 12 (H_{12}): On average, transfer players will have higher *win shares per 40 minutes* (*WS/40*) than freshmen of the same position.

Methods & Results

Data

A comprehensive list of transfers made by NCAA men's basketball players from 2012-13 to 2016-17 was provided by a contact at the NCAA's national office. The list contained the transfer players' names, positions, class ranks, years in which they transferred, and names of the schools they transferred to and from. We subset the initial dataset so that it only included the 1,264 players who had transferred between Division I institutions. The condensed dataset was

used to construct a social network analysis of the transfers that took place during this time. First, we developed a one-mode network matrix using the Nodelist format in UCINET, in which the first column represents schools that students left and the second column shows schools that they joined. Second, we constructed an attribute matrix using the Matrix format in UCINET, which lists the schools and their conference and state.

For the analyses related to the transfers' on-court performances, the dataset was further cleaned and condensed to include the 1,160 players who transferred directly between NCAA Division I programs and played at least one minute after the transfer. We restricted these analyses to Division I players because they represent the largest contingent of NCAA men's basketball transfers, their statistics are more readily available, and there are greater economic implications associated with their movements. The requirement for players to play at least one minute after a transfer was necessary in order to have samples of pre-transfer and post-transfer statistics to compare. While the exclusion of players whose college careers never resume at the Division I level will understate some of the negative effects surrounding a transfer, it is an inherent limitation given the design of the study.

All statistical performance data on these players were obtained from *sports-reference.com/cbb*, a website that has been used extensively in prior research in this area (Pifer, DeSchriver, Baker, & Zhang, 2019; Turcott & Pifer, 2018). The recorded data included the players' total games appeared in, total minutes played, minutes per game, usage percentages, overall win shares, and win shares per 40 minutes from the season before and season after they transferred. An additional dataset containing the win shares of all NCAA Division I freshmen who appeared for at least one minute between 2012-13 and 2016-17 was also pulled from *sports-reference.com/cbb* for purposes of comparing the performances of transfer players to a group of replacement level players. These statistics were chosen to provide interpretable, traditional measures of success (e.g., achieving playing time by earning more minutes or appearing in more games) and more precise, advanced measures (e.g., usage rates and win shares) that remove some of the noise associated with the general descriptors. Descriptions of the usage rate and win share metrics were provided in the literature review section.

Statistical Analyses

The first analysis conducted was a social network analysis of all NCAA men's basketball transfers that took place between the 2012-13 and 2016-17 seasons. Social network analysis involves the mapping and measuring of relationships and flows between individuals and/or organizations (Borgatti, Mehra, Brass, & Labianca, 2009). As such, we used this method to observe and measure the flow of transfers between NCAA men's basketball programs across a 5-season timeframe. In this way, we could gain a clearer understanding of the modern transfer network's inner workings.

Social network analysis comprises three levels (Borgatti, Everett, & Johnson, 2018). First, the node-level analysis explores unique characteristics of an individual person or organization within the network. For example, degree centrality, or the connectivity of a node, often indicates relative importance of the node within the network. Second, the dyad-level analysis focuses on a particular set of nodes that are likely to establish a tie. One of the well-established concepts in this type of analysis is homophily, which suggests that nodes that share certain traits (e.g., gender, race, occupation) are more likely to form a tie than nodes that do not (McPherson, Smith-Lovin, & Cook, 2001). To test such a dyad-level hypothesis, researchers use

network analysis software such as UCINET rather than standard software packages like SPSS and Stata because the latter are programmed to analyze vectors rather than matrices (Borgatti et al., 2018). UCINET offers analysis techniques to test dyad-level hypotheses, including quadratic assignment procedures (QAP) and multiple regression quadratic assignment procedures (MR-QAP). Finally, the network-level analysis informs the unique nature of a whole network. For example, a network's average degree and density indicate the cohesiveness of the network.

Because the current study is one of the first to examine the NCAA men's basketball transfer network, we conducted all three levels of analysis to provide various insights into the network. We first examined network-level measures (i.e., average degree, density, and dyad reciprocity) to explore the unique nature of the transfer network. We also created maps of the network to visualize its cohesion. Next, we conducted node-level analysis by examining each school's in-degree centrality and out-degree centrality. These centrality measures helped us identify schools that play important roles in the transfer network. Finally, we conducted MR-QAP to identify patterns in transfer movement. MR-QAP is a nonparametric, permutation-based analysis that regresses a dependent relational matrix on independent relational matrices. Specifically, rows and columns of the independent matrices and the dependent matrix are repeatedly permutated to produce the distribution of all possible regression coefficients (Krackhardt, 1988). Then, these distributions are used to calculate *p*-values that allow the MR-QAP results to be interpreted like a standard multiple regression; that is, a low *p*-value indicates that the observed correlation has a low probability of being random. For this analysis, we created two hypothetical matrices based on schools' conferences and states. As mentioned in the literature review, we chose these two factors because transfer and enrollment decisions may be influenced by the prestige and limitations of a school's conference and the school's location (Johnson, Wessel, & Pierce, 2013; Letawsky, Schneider, Pedersen, & Palmer, 2003). UCINET 6 was used to conduct these analyses.

The next portion of the examination was concerned with comparing transfer athlete productivity in the seasons immediately before and after a switch was made. In order to do this, a series of hypotheses were tested using paired sample *t*-tests. Paired sample *t*-tests, also known as dependent sample *t*-tests, are appropriate for determining whether the means of two observations taken from the same subject are significantly different. This makes it the natural method for analyzing whether transfer players' statistics significantly differ across two seasons. Further hypotheses were tested to compare whether the performances of transfer players significantly differ from the performances of true freshmen at the same positions. True freshmen were chosen because they represent the natural replacement level player in collegiate sport. If a team cannot acquire new talent via transfers, it must recruit high school graduates to become part of the program. Because we were analyzing two distinct samples in these situations, Welch's two-sample *t*-tests were employed. This method is used to test the hypothesis that the two independent samples have equal means. This made it appropriate for determining whether the mean performance statistics for one group of players was significantly different from the other.

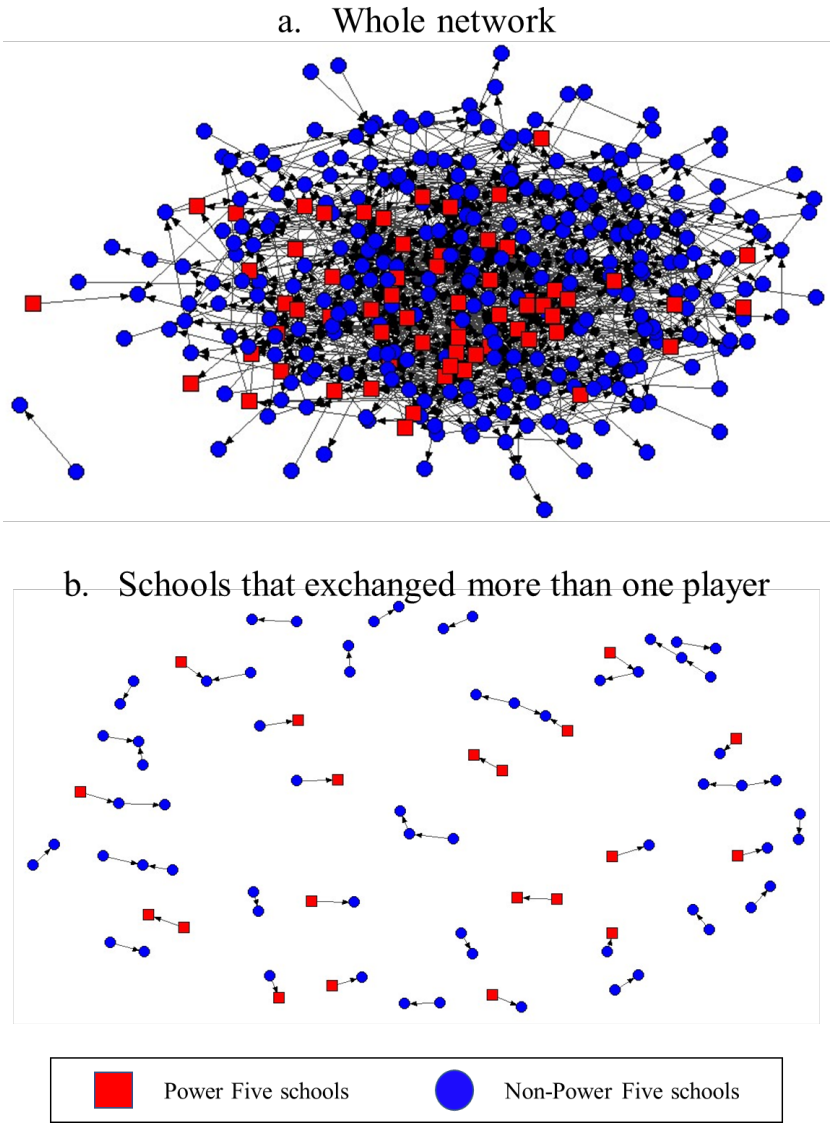
Descriptive Statistics of the Transfer Network

From 2012-13 to 2016-2017, our sample showed that 1,264 men's basketball players transferred directly between Division I schools following their freshman (n = 230), sophomore (n = 420), junior (n = 448), or senior (n = 166) seasons. Of these transfers, 701 (55.5%) transferred between non-Power Five schools, 191 (15.1%) transferred from a non-Power Five school to a

Power Five school, 287 (22.7%) transferred from a Power Five school to a non-Power Five school, and 85 (6.7%) transferred between Power Five schools. Much like the NCAA's (2021) reports, these initial percentages allude to a network comprised mostly of transfer athletes moving laterally between schools in similar conferences.

The results of the social network analysis reveal the key characteristics of the transfer network. First, the average degree was 3.55, meaning that 3.55 players, on average, transferred from or to each school across the five-season timeframe. The network's density was .010, suggesting that the transfer network is not cohesive and that schools used only 1% of their potential connections with other schools. Dyad reciprocity was .013, meaning that just 1.3% of the schools formed reciprocal relationships by having players move in both directions. Figure 1 depicts two networks: the top one shows all observed ties, whereas the bottom one only shows ties between schools that exchanged more than one player. This figure indicates that multiple athletes rarely transferred between the same two schools during the observed time period.

Figure 1.
The Division I Transfer Network (2012-13 to 2016-17)



Centrality Measures of the Schools

Next, we examined which schools were playing key roles in the transfer network according to two centrality measures: in-degree centrality and out-degree centrality. *In-degree centrality* refers to the number of players a school received from other schools between 2012-13 and 2016-17. As Table 1 shows, Indiana University–Purdue University Indianapolis (IUPUI) ranked at the top with 14 players received; next were Iowa State University (13 players), Texas Southern University (13 players), the University of Charleston (12 players), and Georgia Tech University (12 players). *Out-degree centrality*, by contrast, refers to the number of players a school has sent to other schools between 2013 and 2017. As Table 2 shows, the University of South Florida ranked at the top, sending 17 players, followed by George Washington University (15 players), Tulane University (13 players), the University of Missouri (13 players), and the University of New Mexico (13 players).

We tested H_1 by examining whether schools that moved to another conference between 2012-13 and 2016-17 showed higher in-degree or out-degree centrality. Consistent with H_1, the results indicated that schools that moved to another conference during these seasons had higher in-degree centrality (n = 58, M = 4.62, SD = 2.80) than those that did not (n = 244, M = 4.08, SD = 2.60). Similarly, schools that experienced a conference change showed higher levels of out-degree centrality (n = 62, M = 4.26, SD = 3.15) than other schools (n = 248, M = 4.03, SD = 2.73). However, these mean differences were only marginal, offering limited support for the assumption that increased transfers are associated with conference changes. We then tested H_2 by examining whether schools that changed head coaches between 2012-13 and 2016-17 showed higher in-degree or out-degree centrality. We found that schools that experienced coaching changes had notably greater in-degree centrality (n = 182, M = 4.58, SD = 2.67) than other schools (n = 120, M = 3.58, SD = 2.51). Additionally, programs that changed head coaches tended to have visibly higher levels of out-degree centrality (n = 190, M = 4.37, SD = 3.04) than schools that did not (n = 120, M = 3.61, SD = 2.34). Taken together, the results provided clear support for H_2 and only marginal support for H_1. While head coaching changes may lead to more men's basketball transfers in and out of a Division I school, conference changes may not.

Antecedents of Men's Basketball Transfers

We conducted MR-QAP to examine whether players tend to transfer across conferences and across states. For this analysis, we created two hypothetical matrices based on schools' conferences and states (Borgatti et al., 2018). Specifically, we developed one hypothetical matrix assuming that two schools in the same conference have a tie (conference-based matrix) and another on the assumption that two schools in the same state have a tie (state-based matrix). We treated these two hypothetical matrices as independent variables and the observed network matrix as the dependent variable. In support of H_3, the results suggested that the state-based matrix had a significant relationship with the observed matrix (standardized coefficient = .009, p = .008), meaning that players tend to transfer within the same state. However, there was no significant relationship between the conference-based matrix and the observed matrix (standardized coefficient = -.005, p = .063), meaning H_4 was not confirmed.

Table 1
Top 10 NCAA Div. I Men's Basketball Programs Ranked by In-Degree Centrality

Ranking	University	In-Degree Centrality
1	IUPUI	14
2	Iowa State University	13
2	Texas Southern University	13
4	University of Charleston	12
5	Georgia Tech University	12
6	Duquesne University	11
7	Florida Gulf Coast University	10
7	George Washington University	10
7	Hofstra University	10
7	Iona College	10
7	University of Kansas	10
7	University of Nevada	10
7	University of Nevada, Las Vegas	10

Note: IUPUI = Indiana University–Purdue University Indianapolis

Table 2
Top 10 NCAA Div. I Men's Basketball Programs Ranked by Out-Degree Centrality

Ranking	University	Out-Degree Centrality
1	University of South Florida	14
2	University of Missouri	13
2	University of New Mexico	13
4	George Washington University	12
4	Tulane University	12
4	Illinois State University	12
4	University of Memphis	12
4	University of North Carolina at Charlotte	12
9	Rutgers University	11
9	University of Nevada, Las Vegas	11

Player Performance Outcomes & Comparisons

As highlighted in the literature review, the following hypotheses were tested in order to see whether NCAA Division I men's basketball players' athletic opportunities and performances changed following a transfer:

H_5: Players will appear in more *games* (*G*) after transferring programs.

H_6: Players will play more *total minutes* (*MP*) after transferring programs.

H_7: Players will average more *minutes per game* (*MP/G*) after transferring programs.

H_8: Players will have higher *usage percentages* (*USG%*) after transferring programs.

H_9: Players will have higher *win shares* (*WS*) after transferring programs.

H_{10}: Players will have higher *win shares per 40 minutes* (*WS/40*) after transferring.

In addition, the two hypotheses below were tested to see whether transfers' average win contributions varied from those of freshmen at the same position:

H_{11}: On average, transfer players will have higher *win shares* (*WS*) than freshmen of the same position.

H_{12}: On average, transfer players will have higher *win shares per 40 minutes* (*WS/40*) than freshmen of the same position.

Hypotheses 5-10 were examined using paired *t*-tests. H_{11} and H_{12} were tested using a series of Welch, two-sample *t*-tests. We felt that *t*-tests were adequate given the frequency of lateral moves in the transfer network and the steps we took to subset the data by position and playing time when comparing different groups of players. Furthermore, because the advanced metrics condense individual skill to a single number, they are inherently more applicable to mean comparisons than traditional measures of player performance.

Table 3 displays the results of the *t*-tests from hypotheses 5-10. The results indicate that game appearances, total minutes played, minutes per game, win shares, win shares per 40 minutes, and usage percentages all increase significantly ($p < .001$) in the season after a player transfers. As such, we find support for hypotheses 5-10. The average transfer player will appear in approximately 2.5 more games, play approximately 149 more total minutes, average nearly four more minutes per game, contribute nearly one additional win (.022 additional wins per 40 minutes), and use approximately 1% more of a team's plays after switching programs.

But how do they rate in comparison to a replacement level player? To further explore this question and the last two hypotheses, a series of Welch, two-sample *t*-tests were conducted on the win shares of freshman players and transfer players of the same position (guard, center, and forward). That is, the win shares of the freshmen at a certain position were analyzed in comparison to the win shares of the transfer players at the same position. The results are displayed in Table 4 for both win shares and win shares per 40 minutes at each positional

category. In support of H_7 and H_8, the results indicate that the true differences in the win shares of the transfers and freshmen were not equal to zero. At the guard position, transfers averaged approximately 1.25 more wins per season and .056 more wins per 40 minutes than freshmen. For centers and forwards, the differences were .743 (.049 per 40 minutes) and .988 (.034), respectively. These findings allude to the positive utility offered by transfers when compared to replacement level players of the same position. The implications of these findings are further discussed in the section that follows.

Table 3
Mean Statistical Values of NCAA Div. I Men's Basketball Players Pre and Post Transfer

Variable	μ_{pre}	μ_{post}	μ_{diff}	*t*-stat	*DF*	*p*-value
G	25.666	28.134	2.468	-6.8113	1159	< .001
MP	493.138	642.519	149.381	-13.356	1159	< .001
MP/G	17.634	21.562	3.928	-12.638	1159	< .001
WS	1.116	1.800	0.684	-16.111	1159	< .001
WS/40	0.076	0.098	0.022	-5.826	1159	< .001
USG%	19.106	20.062	0.956	-4.962	1159	< .001

Note: includes 1,160 transfer athletes from the 2012-13 to 2016-17 seasons.

Table4
Mean Win Share Differences between NCAA Div. I Men's Basketball Transfers and Freshmen

	WS					WS/40				
	μ_{xfer}	μ_{fresh}	*t*-stat	*DF*	*p*-value	μ_{xfer}	μ_{fresh}	*t*-stat	*DF*	*p*-value
Guards	1.897	0.645	21.750	826.83	< .001	0.096	0.040	13.023	1370.2	< .001
Centers	1.367	0.624	5.218	125.82	< .001	0.100	0.051	4.479	226.02	< .001
Forwards	1.709	0.721	14.067	548.71	< .001	0.101	0.067	7.570	653.87	< .001

Note: the sampled timeframe ranged from 2012-13 to 2016-17.

Discussion

This study peered into the transfer network for NCAA Division I men's basketball players over a 5-year period in an attempt to identify patterns in their movement and see if they accrued more minutes and posted better performances following a transfer. Given the recent trend of loosened transfer restrictions, we felt now was an appropriate time for such analyses. Discussing first the results of the transfer network analysis, our findings did not reveal many identifiable patterns in the network for men's basketball transfers from 2012-13 to 2016-17. Rather, the network was characterized by low density and low reciprocity, consisting mostly of weak ties between programs. This could be due to the shorter timeframe of the data, as true transfer pipelines might only form and be identifiable over longer periods of time. Furthermore,

although the transfer restrictions have loosened in recent years, their more widespread existence during the examined timeframe may have prevented transfers from occurring consistently between certain clusters of schools. On average, schools were involved in just 3.5 transfers over the five-year period (0.7 per season).

It could also be that college athletes transfer for unique reasons and choose their new destinations based on characteristics specific to their circumstances. While better opportunities in Division I athletics may be at the front of their minds (Flowers et al., 2014; Burgess & Cisneros, 2018), academic regulations, NCAA and conference restrictions, discrimination, family issues, and other more personal, random circumstances may dictate where transfers ultimately end up. Sometimes, the athletes may have no other choice but to transfer if they wish to continue playing. We found, for example, that when schools changed head coaches, more in-flows and out-flows occurred. This aligns with the research of Pate, Stokowski, and Hardin (2011), who highlighted the difficulties college athletes face during coaching transitions. Such wholesale changes are beyond the control of the college athlete and often indicate a broader change in program ambition or philosophy. New athletes are being brought in to replace the old ones, and multiple transfers are likely to occur as the institution and coach seek to fashion a team of their own making. Seeing as these idiosyncrasies are neither predictable nor confined to any one school or set of schools, we were not wholly surprised to find weak ties in the overall Division I transfer network.

However, we did use MR-QAP to test for potential transfer determinants and found that Division I men's basketball players tend to transfer within state more frequently; that is, stronger ties existed between schools located in the same state. The implications of this are such that schools looking for talent may be wise to keep an eye on the transfer portal for transfers leaving programs inside the same state lines. Whether due to the transfer athletes being able to maintain cheaper in-state tuition, choosing to remain closer to family at home, or being familiar to and with the other coaches and programs in the region, there is a significant tendency for transfers to remain inside state lines. Conversely, there were no significant ties between schools in the same conference. This is likely due to most conferences imposing transfer restrictions and season-long bans on athletes who want to move to a rival program. As these restrictions loosen, though, it will be interesting to see if the pattern changes. Conference opponents, after all, have likely scouted and faced the athlete on a more regular basis, lending them the added advantage of knowing the player's strengths and weaknesses on a deeper level.

In terms of on-court, performance-related benefits, the averages suggest that Division I athletes may improve both their own prospects and the prospects of the team to which they transfer. From a personal opportunity standpoint, the typical transfer will see their minutes on the court increase by an average of almost four minutes per game. They will also be utilized in significantly more offensive plays and feature in significantly more games. These results speak to the positive benefits that a loosened transfer market could afford college athletes who are hoping to play more for personal or professional interests. Similar to workers in other industries where non-competes are implemented (Marx, 2011), research has shown that college athletes can also suffer from a lack of satisfaction and other negative ramifications if stuck in suboptimal situations (Le Crom et al., 2009; Pate, Stokowski, & Hardin, 2011). For some transfer athletes, it is not as much about finding a better opportunity for athletic participation as it is escaping a toxic athletic or academic environment (Cooper & Hawkins, 2014; Pate et al., 2011). Imposing fewer limitations on transfers could provide these athletes with an option to address their negative associations without forcing them to take the career detours and risks brought on by restrictive

NLIs. In a less restrictive market, athletes would be able to transfer and participate immediately, removing the penalties forced upon them when they mistakenly chose a toxic environment out of high school.

Shifting to personal performance, we examined how Division I players' win shares changed following a transfer. Because total win shares are influenced by playing time, we also looked at win shares per 40 minutes (*WS/40*) as a more standardized measure of performance efficiency. By both measures, the athletes improved after transferring. Though this may be due in part to the team and league to which they transferred, it is still worth noting that they improved. Given the opportunity to play for a new coach and in a new system or conference, they were able to take advantage of the opportunity and contribute more wins to their new programs. This suggests that a change of scenery may help revitalize the collegiate career of a college athlete while also lending additional utility to the acquiring team.

Seeing these results, we were prompted to compare the win shares of transfer players to freshmen. Interestingly, freshmen, as the most natural replacement players in college sport, generally accounted for fewer wins than transfers across the guard, center, and forward positions. The difference was particularly noticeable at the guard and forward positions, where an additional 1.252 and 0.988 wins, respectively, were generated by transfer athletes. Even after controlling for the effects of playing time via the *t*-tests examining group differences in the *WS/40* metric, similar results were found. Across a 1,320-minute (33-game) season, a Division I team composed of transfers (2 guards, 2 forwards, and 1 center) with average *WS/40* values would be expected to win approximately eight more games than a team of average freshmen. Although there are additional individual and program related factors that may need to be controlled for, these preliminary results highlight the potential benefits of transfer athletes to their new teams.

Taken together, our findings offer evidence of increased mobility leading to a net benefit for the key parties of the NCAA Division I men's basketball industry. After transferring, the athletes became individual beneficiaries of increased playing time and usage. They were also more productive in terms of basketball performance, contributing significantly more wins to their new programs than their old ones. They also contributed more wins, on average, than freshmen of the same position, highlighting the unique human capital that may be attached to them. Yet, the term "net" benefit suggests that something is being risked or sacrificed in exchange for the benefit. Most likely, the industry is fearful of competitive balance being the tradeoff in a scenario where transfers are more permissible (Cali, 2014). Marx and Fleming (2012) noted how the increased mobility afforded by an absence of non-compete agreements incentivizes workers in entrepreneurial settings to reallocate themselves to more promising firms. However, such an occurrence would also accelerate the removal of weaker firms, which poses a problem in a setting like the NCAA where "competitive equity" stands as one of its 16 core principles (NCAA, 2020b). The association, like other sports leagues in North America, relies on a peculiar mixture of competitive cooperation between rival firms in order to produce sporting events (Neale, 1964). This distinguishes the NCAA and its member institutions from individual firms competing for profits in traditional business settings. Nonetheless, Marx and Fleming's (2012) point alludes to the rationale behind many of the NCAA's imposed restrictions, as the assumed risk is that increased college athlete mobility and autonomy will decrease parity and harm the overall product (Cali, 2014).

While our study did not focus on measuring competitive balance, our results and the results of prior research (NCAA, 2021) can help assuage some of the concerns that increased

mobility will always lead to decreased parity. For starters, there was no clear pattern to the allocation of Division I transfer talent outside of stronger ties between schools in the same state and more consistent in-flows and out-flows from programs experiencing coaching changes. Indeed, most (62.2%) of the transfers were lateral moves in which the players transferred between two non-Power Five schools or two Power Five schools, while the number of upward transfers from non-Power Five to Power Five schools (15.1%) and downward transfers from Power Five to non-Power Five schools (22.7%) occurred with similar frequency and represented smaller proportions of the sample. Even if we condense the sample further and look at the landing spots of the top-performing transfers (i.e., those in the top quartile of *WS/40* prior to their transfer), we still find that a majority 54% (n = 291) made lateral moves. As such, we can loosely conclude that transfers are neither contributing to a steady talent drain (Marx et al., 2015) from weaker to stronger conferences nor threatening non-major programs' abilities to compete (Marx & Fleming, 2012). Rather, the recent market for player transfers has primarily facilitated the movement of skilled individuals between programs in conferences of a similar quality, programs in the same state, and between programs where coaching changes have prompted a move.

That transfers occur more frequently in and out of teams undergoing coaching changes further suggests that transfers may be helpful for restoring stability to struggling programs. Programs hiring new coaches are likely coming through a period of turmoil, meaning the ability to shuffle the appropriate players in and out of a system could enhance competitive balance by giving troubled programs a quicker means to improvement. In recent times, several Division I men's basketball programs, including Wake Forest, Grand Canyon and James Madison, have relied on transfers to bring stability to their rosters during regime changes (Associated Press, 2020). "Maturity comes into play with transfers," notes ACC analyst and former NCAA Division I men's basketball player Jordan Cornette. "Those are the ones you will lean heavily on because they have proven they can make the jump from high school to college. They can manage their academics. They can play at this level. They can be competitive. They can be voices" (Associated Press, 2020, para. 9). Our findings similarly imply that athletic administrators could help rebuild their programs by hiring coaches who are willing to embrace the benefits of recruiting transfer athletes. The ramifications of this are not exclusive to Division I basketball, as any athletics program that experiences coaching changes can find merit in committing considerable time to recruiting transfer athletes. It may even be beneficial for athletic administrators to recommend this approach to their current or incoming coaching staffs as a means of guiding these employees to more effective practices. Pushing employees to pursue more effective approaches to recruiting can create more efficient and effective means of program success that do not require significant financial commitments as a means of improving the status of the program, such as new athletic facilities (Huml, Pifer, Towle, & Rode, 2019).

Indeed, evidence to this point has not suggested that transfers will only move "upward" to schools in stronger conferences, but that Division I men's basketball transfers may just go to the programs that afford them the best personal opportunities. If a highly rated men's basketball recruit fails to make it at one institution for personal reasons not related to his inherent level of talent (e.g., scheme fit, coach issues, social integration, injury, etc.), he could transfer "downward" to another institution and earn valuable minutes assisting a team that might not have had a chance to recruit him in the initial market. Prior examinations have suggested that a college market with more freedom would allow underappreciated athletes at big schools to go from being the "small fish in the big pond" to the "big fish in the small pond" (Cali, 2014, p. 237) when switching to new programs. Such a thought process aligns with the recruiting trends seen

in successful mid-major programs (e.g., Gonzaga), where recruiting losses to Power Five schools on the domestic front are offset through the recruitment of quality international players (Turcott & Pifer, 2018). The increased mobility of playing talent would allow talented athletes to escape bad situations more easily, thereby reducing talent concentration and making their skills accessible to suitors that can actually benefit from them. With prior studies suggesting that competition is already imbalanced in the NCAA's revenue sports (Peach, 2007; Sanderson & Siegfried, 2003), and that increases in player mobility and availability may have negligible or positive effects on competitive balance in college basketball (Mills & Salaga, 2015) and other sports leagues (Maxcy & Mondello, 2006; Schmidt & Berri, 2005; Fort & Quirk, 1995), it is certainly something for the NCAA to consider as it continues to revise its policies on player transfers.

Instead of being solely concerned with the flow of talent between certain types of programs, perhaps the NCAA should further consider the impact its transfer restrictions are having on the flow of men's basketball talent to its top division. Would fewer quality players leave the NCAA as early for foreign or domestic professional leagues if they knew a greater opportunity for advancement still existed in college ball? Recent evidence has shown that the number of underclassmen declaring for the NBA Draft or skipping college to play professionally overseas is rising, so it is certainly a phenomenon worth exploring (Norlander, 2019; O'Donnell, 2019). Ultimately, whether any of these conditions would hold in a market free of NLI limitations remains a subject for future researchers to examine, but our findings offer preliminary evidence of transfers leading to net benefits for players and teams. In consideration of the benefits available to both sides in a less-regulated transfer market, NCAA and conference administrators should continue evaluating the transfer process and its potential implications moving forward. Likewise, potential Division I transfers can take this information knowing that, if they can see the court at their next program, their opportunities and performances will likely improve.

Limitations and Recommendations for Future Research

Future studies in this area could gain a broader understanding of the transfer network by expanding the sample beyond the five seasons that were examined. Though such data may be difficult to obtain, this information would provide a lengthier timeframe for analyzing patterns in college athlete movement. Extending the scope of analysis beyond men's basketball to the NCAA's other revenue sport, football, might also yield interesting and relevant results. Football programs generally make more money than men's basketball, so the financial and economic implications might hold even more weight. Three of the four starting quarterbacks in the 2019 College Football Playoff, for example, were transfer athletes, alluding to the possible gains that can be accrued from football players arriving in a new setting.

Furthermore, the data could be expanded to include more traditional and advanced playing statistics for the transfer and freshman athletes. While win shares are useful for summarizing a player's overall impact in one metric, it might be interesting to know which unique skills and abilities—if any—are more prevalent in transfer athletes. For example, prior analyses have hinted at the potential for players with more prior March Madness experience (Pifer et al., 2019) to provide additional on-court benefits. Additional research has also suggested that a player's country of origin may endow him with technical abilities that are different from those seen in American athletes (Turcott & Pifer, 2018). These individual characteristics do not

even account for the coach and team-specific factors that may further influence a player's ability to perform at a high level. Therefore, future studies would be wise to extend the analyses from *t*-tests on stratified samples to statistical models incorporating numerous explanatory and control variables. While the transfer players, on average, might be improving, what are the factors that have led to their improvement? In addition, while transfer players may contribute more wins to their new teams than their old teams, do team records tend to improve when they pull talent from the transfer portal? Such questions are worth exploring for the additional knowledge they may lend to college athletes and teams in these situations.

Shifting to the impact that increased player mobility might have on competitive balance, we also recommend that researchers, in time, take a closer look at any changes in parity that occurred following the implementation of the aforementioned conference and NCAA rule changes. While our study was more concerned with the implications of transfers as they relate to athletes' performances and opportunities, future studies could explore in more depth the impact of transfers on competition within the NCAA and its conferences. This way, they would be able to note whether the various policy changes led to breaks in the competitive trends that previously existed. It is also worth mentioning that our comparative analyses excluded players that did not make an appearance for the school to which they transferred. Though this level of attrition was small (8%) at the Division I level during the timeframe we examined, it might be worth exploring the circumstances that caused a player to get lost in the shuffle.

Conclusion

This study conducted a social network analysis on NCAA Division I men's basketball transfers within a five-season timeframe and found a network characterized by low density and low reciprocity among the member schools. While no clear patterns emerged between any set of programs, in-state ties were stronger and transfers between non-Power Five schools occurred more frequently. Transfers also occurred with greater frequency in and out of programs that were changing head coaches. We then conducted a series of paired sample *t*-tests to see if transfers' opportunities and performances significantly changed following a switch. We also used independent sample *t*-tests to see if their mean contributions, in terms of win shares and win shares per 40 minutes, significantly differed from those of freshmen at the same position. Ultimately, we found that NCAA Division I men's basketball transfers will average more games, more minutes, higher usage percentages, and more win shares in the season following a transfer. They also average more win shares and win shares per 40 minutes than freshman players who play the same position. Taken together, the findings suggest that transfers may provide a net benefit to the parties involved, highlighting the need for the NCAA and its conferences to continue examining and adjusting their regulations on college athlete transfers.

References

Associated Press. (2018, Oct. 5). NCAA pondering immediate eligibility for transfers after summer coaching changes. *ESPN*. Retrieved from http://www.espn.com/college-football/story/_/id/24905018/ncaa-looking-more-changes-college-football-transfer-rules

Associated Press. (2020, June 29). New men's basketball coaches relying on transfers to stabilize programs. *TRIB Live*. Retrieved from https://triblive.com/sports/new-mens-basketball-coaches-relying-on-transfers-to-stabilize-programs/

Becker, G. S. (1962). Investment in human capital: A theoretical analysis. *Journal of Political Economy*, *70*(5, Part 2), 9-49.

Borgatti, S. P., Everett, M. G., & Johnson, J. C. (2018). *Analyzing social networks*. London, UK: Sage.

Borgatti, S. P., Mehra, A., Brass, D. J., & Labianca, G. (2009). Network analysis in the social sciences. *Science*, *323*, 892-895.

Burgess, J., & Cisneros, J. (2018). The semester of struggle: Male junior college transfer student-athletes' experiences. *Journal of Issues in Intercollegiate Athletics*, *11*, 266-286.

Cali, M. R. (2014). The NCAA's transfer of power: An analysis of the future implications the proposed NCAA transfer rules will have on the landscape of college sports. *Jeffrey S. Moorad Sports Law Journal, 21*, 217-257.

Cooper, J. N., & Hawkins, B. (2014). The transfer effect: A critical race theory examination of black male transfer student athletes' experiences. *Journal of Intercollegiate Sport, 7,* 80-104.

Flowers, R. D., Luzynski, C., & Zamani-Gallaher, E. M. (2014). Male transfer student athletes and Schlossberg's Transition Theory. *Journal for the Study of Sports and Athletes in Education, 8*, 99-120.

Fort, R., & Quirk, J. (1995). Cross-subsidization, incentives, and outcomes in professional team sports leagues. *Journal of Economic Literature*, *33*(3), 1265-1299.

Harper, S. R. (2009). Race, interest convergence, and transfer outcomes for black male student athletes. *New Directions for Community Colleges, 147*, 29-37.

Hersch, P. L. (2012). Does the NCAA coaching carousel hamper the professional prospects of college football recruits? *Journal of Sport Economics, 13*, 20-33.

Hosick, M. B. (2018, June 13). New transfer rule eliminates permission-to-contact process. *NCAA*. Retrieved from http://www.ncaa.org/about/resources/media-center/news/new-transfer-rule-eliminates-permission-contact-process

Huml, M. R., Pifer, N. D., Towle, C., & Rode, C. R. (2019*)*. If we built it, will they come? The effect of new athletic facilities on recruiting rankings for Power Five football and men's basketball programs. *Journal of Marketing for Higher Education*, *29*, 1-18.

Ingold, D., & Pearce, A. (2015, March 18). *March Madness makers and takers*. Bloomberg. https://www.bloomberg.com/graphics/2015-march-madness-basketball-fund/

Johnson, J. E., Wessel, R. D., & Pierce, D. A. (2013). Exploring the influence of select demographic, academic, and athletic variables on the retention of student-athletes. *Journal of College Student Retention: Research, Theory & Practice*, *15*(2), 135-155.

Krackhardt, D. (1988). Predicting with networks: Nonparametric multiple regression analysis of dyadic data. *Social Networks*, *10*, 359-381.

LeCrom, C. L., Warren, B. J., Clark, H. T., Marolla, J., & Gerber, P. (2009). Factors contributing to student-athlete retention. *Journal of Issues in Intercollegiate Athletics, 2*, 14-24.

Letawsky, N. R., Schneider, R. G., Pedersen, P. M., & Palmer, C. J. (2003). Factors influencing the college selection process of student-athletes: Are their factors similar to non-athletes? *College Student Journal*, *37*(4).

Marx, M. (2011). The firm strikes back: non-compete agreements and the mobility of technical professionals. *American Sociological Review*, *76*(5), 695-712.
Marx, M., & Fleming, L. (2012). Non-compete Agreements: Barriers to Entry… and Exit? *Innovation Policy and the Economy*, *12*(1), 39-64.
Marx, M., Singh, J., & Fleming, L. (2015). Regional disadvantage? Employee non-compete agreements and brain drain. *Research Policy*, *44*(2), 394-404.
Maxcy, J., & Mondello, M. (2006). The impact of free agency on competitive balance in North American professional team sports leagues. *Journal of Sport Management*, *20*(3), 345-365.
May, K., & Seifried, C. (2012). NCAA transfer rules: Restrictions created to benefit Division I-A institutions and hinder student-athletes? *Journal of Contemporary Athletics, 6*, 159-172.
McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology*, *27*, 415-444.
Meyer, S. (2004). Unequal bargaining power: Making the national letter of intent more equitable. *Marquette Sports Law Review, 15*(1), 227-247.
Mills, B. M., & Salaga, S. (2015). Historical time series perspectives on competitive balance in NCAA Division I basketball. *Journal of Sports Economics*, *16*(6), 614-646.
NCAA. (2018, Dec. 18). *NCAA Research: Tracking transfer in Division I men's basketball.* Retrieved from http://www.ncaa.org/about/resources/research/tracking-transfer-division-i-men-s-basketball
NCAA. (2019a). *About us: What is the NCAA?* Retrieved from http://www.ncaa.org/about/resources/media-center/ncaa-101/what-ncaa
NCAA. (2019b). *About us: Where does the money go?* Retrieved from http://www.ncaa.org/about/where-does-money-go
NCAA. (2019c). *About us: Division I academic eligibility*. Retrieved from http://www.ncaa.org/about/division-i-academic-eligibility
NCAA. (2020a). *Estimated probability of competing in professional athletics*. Retrieved from http://www.ncaa.org/about/resources/research/estimated-probability-competing-professional-athletics
NCAA. (2020b). *About us: The 16 Principles for Conduct of Intercollegiate Athletics*. Retrieved from http://www.ncaa.org/about/16-principles-conduct-intercollegiate-athletics
NCAA. (2021). *Destination of 2020 NCAA Division I Men's Basketball Transfers.* Retrieved from https://ncaaorg.s3.amazonaws.com/research/transfers/2020-21RES_DestD1MBBTransfers.pdf
NCSA. (2020). *National Letter of Intent and National Signing Day*. Retrieved from https://www.ncsasports.org/recruiting/managing-recruiting-process/national-signing-day
Neale, W. C. (1964). The peculiar economics of professional sports. *The Quarterly Journal of Economics*, *78*(1), 1-14.
Norlander, M. (2019, May 31). *College basketball is losing more underclassmen every year to the NBA Draft, but can the NCAA reverse the trend?* CBS Sports. Retrieved from https://www.cbssports.com/college-basketball/news/college-basketball-is-losing-more-underclassmen-every-year-to-the-nba-draft-but-can-the-ncaa-reverse-the-trend/
O'Donnell, R. (2019, August 8). *How elite high schoolers are skipping college to get to the NBA*. SB Nation. Retrieved from https://www.sbnation.com/college-basketball/2019/8/8/20753788/nba-draft-college-basketball-recruiting-lamelo-ball-rj-hampton

Oliver, D. (2004). *Basketball on paper: Rules and tools for performance analysis*. Washington, DC: Potomac Books, Inc.

Pate, J. R., Stokowski, S. E., & Hardin, R. (2011). Third time's a charm: The case of Tennessee's four junior football players who endured three different head coaches in three seasons. *Journal of Issues in Intercollegiate Athletics, 4*, 354-369.

Peach, J. (2007). College athletics, universities, and the NCAA. *The Social Science Journal*, *44*(1), 12-22.

Pifer, N. D., DeSchriver, T. D., Baker III, T. A., & Zhang, J. J. (2019). The advantage of experience: Analyzing the effects of player experience on the performances of March Madness Teams. *Journal of Sports Analytics*, *5*, 137-152.

Pope, D. G., & Pope, J. C. (2009). The impact of college sports success on the quantity and quality of student applications. *Southern Economic Journal*, *75*(3) 750-780.

Pope, D. G., & Pope, J. C. (2014). Understanding college application decisions: Why college sports success matters. *Journal of Sports Economics*, *15*(2), 107-131.

Price, J. A. (2010). The effects of higher admission standards on NCAA student-athletes: An analysis of Proposition 16. *Journal of Sport Economics, 11*, 363-382.

Rhoads, T. A., & Gerking, S. (2000). Educational contributions, academic quality, and athletic success. *Contemporary Economic Policy*, *18*(2), 248-258.

Sanderson, A. R., & Siegfried, J. J. (2003). Thinking about competitive balance. *Journal of Sports Economics*, *4*(4), 255-279.

Schmidt, M. B., & Berri, D. J. (2005). Concentration of playing talent: evolution in Major League Baseball. *Journal of Sports Economics*, *6*(4), 412-419.

Smith, C. (2018, Sept. 11). *College football's most valuable teams: Texas A&M jumps to No. 1. Forbes*. Retrieved from https://www.forbes.com/sites/chrissmith/2018/09/11/college-footballs-most-valuable-teams/#7f0cc4a66c64

Southeastern Conference. (2019). *SEC Bylaws and Commissioner's Regulations 2019-20.* Retrieved from http://a.espncdn.com/sec/media/2019/Bylaws%20and%20Commissioner%20Regs%20-%20Combined.pdf

Sports-Reference. (2019). *Calculating win shares*. Retrieved from https://www.sports-reference.com/cbb/about/ws.html

Turcott, R., & Pifer, N. D. (2018). The preferred players: A theoretical and comparative analysis of men's basketball recruits at the NCAA's mid-major level. *Journal of Contemporary Athletics*, *12*, 151-173.

West, J. (2020, February 17). *ACC supports one-time transfer rule for all student athletes*. Sports Illustrated. Retrieved from https://www.si.com/college/2020/02/17/acc-one-time-transfer-rule-discussions-all-sports

Wiggins, B. (2018, March 31). *The 25 schools that make the most money in college basketball.* Business Insider. Retrieved from https://www.businessinsider.com/louisville-was-college-basketballs-biggest-money-maker-in-2016-2018-2