Social Networks and Professional Success: Evidence from Foreign Newcomers on the PGA Tour

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Abstract

How do social networks matter for professional success? Are they a source of information and support, both of which could be beneficial? We provide an answer using a unique data set of foreign athletes migrating to the PGA Tour. We construct a nationality-based network of newcomers when they first begin to play in the PGA TOUR, and examine the impact of this initial social network on the newcomers probability of surviving (i.e., keeping their license) at the end of their first PGA TOUR season. We find that social cohesion within a nationality cluster has a sizable positive effect on newcomers' probability of surviving, but no evidence that the centrality of a nationality cluster in the overall PGA TOUR network has an impact on survival. If we consider social cohesion as indicative of the support an individual receives from the network and centrality in the network as a measure of information transmission, then this suggests that support has a more robust impact on performance than information.

Keywords: Competition, Social Networks, Social Support, Information Transmission, Performance

JEL Classification: D91, J44, L83

1. Introduction

The goal of this paper is to examine how social networks matter for performance *in* the job by examining whether networks help newcomers prevail in a highly competitive contest. There are several ways in which social networks could contribute to professional success. First, social connections could be a conduit through which information transmission takes place: about opportunities, referrals, best-practices, or pitfalls to avoid. Second, social networks could serve as a buffer against adversity, providing tangible and intangible social support. These questions are hard to answer because of data limitations and endogeneity concerns. In this paper we examine these issues using a unique data set of foreign professional athletes participating in the PGA TOUR, the professional golf circuit in the US.

We use this data set to construct a nationality-based network of foreign (i.e., non-US) newcomers when they first begin to play in the PGA TOUR, and examine the impact of this initial social network on the newcomers probability of surviving (i.e., keeping their license) at the end of their first PGA TOUR season. There are several reasons why focusing on the initial nationality-based social network provides a cleaner identification of the impact of network embeddedness on

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professional success. First, shared nationality is a form of homophily[2] that is exogenous to performance. That is, a player is not better connected to others by virtue of his past performance, but rather by his nationality, thus mitigating endogeneity concerns. Second, by focusing on the initial social network, we minimize endogeneity concerns relating to the fact that as players perform better throughout the season, they may have opportunities to develop a more advantageous social network, thus muddling the effect of network embeddedness on performance. Third, for many of the foreign players who move to the US to seek fame and fortune, the move presents a difficult transition to an unfamiliar environment where they face hardship stemming from social isolation, cultural distance, and language barriers (Noer, 2012). The move can thus be considered akin to a "shock" with potentially adverse consequences for performance.

Social networks have been considered an effective mechanism through which foreigners can mitigate their disadvantage when competing in a new country (Denk et al., 2012; Hakak et al., 2013). In a high-stakes competitive contest such as the PGA TOUR, where skilled athletes vie to obtain the smallest advantage over others in any given tournament, social networks could provide a competitive edge that helps them survive their first season. A foreign newcomer who is embedded into a nationality cluster that is centrally positioned in the overall PGA TOUR network, and thus a good conduit for information transmission, may have access to valuable information (e.g., golf course specificities, competitors' characteristics) that helps him overcome unfamiliarity with the new environment. Similarly, a foreign newcomer who is embedded into a socially cohesive nationality cluster may get the support needed to go through the hardships of the touring life (i.e., with many weeks per season on the road, loneliness is a frequent symptom on the PGA TOUR (Noer, 2012)).

Economic research on the role of social networks in the labor market has primarily focussed on employment outcomes. A rich research agenda, starting with the seminal work of Granovetter (1973) and Boorman (1975), and continuing with Montgomery (1991, 1992), Topa (2001), Munshi (2003), Calvo-Armengol (2004), Bayer, Ross and Topa (2008), Laschever (2009) and Beaman (2012), provides empirical evidence on the importance of social networks for information transmission and referrals leading to jobs. However, few papers have examined the question of how social networks are associated with performance *in* the job. Notable exceptions are Loury (2006), who finds longer job-tenure for workers who use informal contacts to find jobs, and Cohen et al., (2010) who find that security analysts who exploit educational connections to firms outperform on their stock recommendations.

The main results of our paper are as follows. First, we find that foreign newcomers who are part of a densely knit nationality cluster enjoy a higher probability of surviving (i.e., keeping their license) at the end of their first PGA TOUR season. We interpret this as an indication that nationality clusters that are more socially cohesive provide players with support that is helpful to overcome the hardships of the touring life. Second, somewhat surprisingly, we do not find evidence that being part of a nationality cluster that is centrally positioned in the overall PGA TOUR network, and thus more conducive to obtaining information about the host environment, results in a higher probability of survival. Third, we find that nationality networks are helpful among the non-elite group of players (i.e., the second-tier tour), but not among the elite group players (i.e., the first-tier tour). Fourth, our results are robust to the familiarity of foreign newcomers to the US golfing world: we find that second-tier tour foreigners who previously attended college in the US, and were therefore more accustomed to the local competitive environment, still benefit from belonging to a densely knit nationality cluster. Fifth, we eliminate the possibility that the size of the compatriot population living in the US is a substitute for the support that a player gets from his nationality-based cluster

[2] Defined as the degree to which pairs of individuals share similar personal attributes (Ibarra, 1993).

in the PGA Tour network. That is, even if there is a large immigrant population of compatriots in the US which could provide support and information, this does not confound the effects of PGA TOUR's nationality network on performance. Sixth, we discard the alternative explanation that it is foreigners' nationality itself, and not the nationality-based network in the PGA TOUR, that influences performance. That is, players coming from countries in which golf is very popular are not better prepared to survive in the PGA TOUR.

We believe our paper contributes to the ongoing research agenda on the role of social networks in the labor market in several ways. First, as mentioned earlier, we examine the impact of social networks on performance *in* the job, in contrast to much of the prior research that associates social networks with finding a job. A second point of distinction is our attempt to go beyond the role of social networks as a conduit for information transmission and study the impact of social networks in providing resilience against adversity. The informational role of networks has been relatively well-studied, with a plethora of papers in different contexts. There is much less research in economics on the role of social networks as a source of support[3]. This could be partly due to a lack of data in environments where social cohesion can be plausibly linked to success or failure. Third, as discussed above, when we consider the impact of both informational benefits and cohesion in the social network in contributing to success, we find that our measure of social cohesion is robust in terms of statistical significance while the measure of information transmission fades in significance. A possible interpretation of this could be as follows. If we consider our measure of information akin to the role of weak ties, and our measure of social cohesion as similar to the role of strong ties (Granovetter 1983, Uzzi, 1999), then this suggests that strong ties play a more robust role than weak ties for professional success in the job. This could be considered complementary to the notion that weak ties are widely considered more useful in finding a job. To the best of our knowledge, this is a novel proposition in the literature.

The remainder of the paper is structured as follows. Section 2 motivates our study in the context of the literature on social networks and professional success. Section 3 describes the PGA TOUR, our construction of the overall PGA Tour network, and the initial social network of foreign newcomers. This sets the stage for our network measures and the empirical strategy that are described in Section 4. Section 5 contains our analysis and considers alternative explanations for the influence of social networks on player performance. Section 6 discusses our results, provides caveats, and concludes.

2. Social Networks and Professional Success

Foreigners are often at a particular disadvantage when competing in a new country. Immigrants are less successful than nationals at finding jobs in the host labor market (Fang et al., 2013) and foreign entrepreneurs are less successful than domestic counterparts (Mata and Alves, 2018). Several studies have examined the role that country-of-origin networks play on mitigating foreigners' disadvantage and improving their employment outcomes. Munshi (2003) uses variation in the size of Mexican origin-communities in the US to find that larger origin-community networks improve both employment likelihood and wages for migrant workers. Edin et al., (2003) and Damm (2009) provide evidence that migrants in Sweden and Denmark enjoy increased annual earnings when they live in large nationality enclaves. Beaman (2012) uses data on political refugees resettled in the US to study the causal impact of a refugee's nationality-based social network on labor market outcomes such as employment and wages. Patel and Vella (2013) examine the occupation shares of numerous nationalities in the US and find that newcomers chose the same occupations as their compatriots

[3] There is a large literature in both economics and sociology on the importance of social pressures in fostering cooperation and favor exchange. See Jackson et. al (2012), and the literature on social capital as surveyed in Sobel (2002).

from previous waves of immigration. Elsner et al., (2018) show that if a migrant's nationality network is well integrated in US society, then this leads to increased wages. These studies suggest that sharing a common nationality can be a strong basis for the creation of social ties, especially considering that in these studies none of the foreigners had pre-existing ties with one another prior to arrival in the host country.

What distinguishes our study from previous studies in this area is an attempt to examine how sharing a common nationality contributes to foreign newcomers performance *in* the job, a distinct issue that has not been studied, to the best of our knowledge. While there are a myriad of mechanisms through which social networks can influence and benefit individuals, in our context we focus on two in particular: the role of the network as a conduit for information transmission, and the social network as a source of support, tangible and intangible, that can provide resilience against adversity[4]. The literature on information transmission through social networks is vast, with applications in numerous contexts, such as opinions, product-adoption, fashions, program-participation, viral marketing, and various others. Recent papers that provide extensive surveys are Banerjee et. al. (2019) and Jackson et. al. (2017)[5]. There is also an extensive literature, mainly in personnel psychology and human resource management, that documents the importance of social support as a buffer against job-related stress, with positive impacts on employee performance (Schreurs et. al. (2012), Stetz et. al (2006), Van Yperen & Hagedoorn (2003)). The fact that social and emotional support impacts performance and can have economic consequences is intuitive and well-known, but remains hard to quantify[6].

With regard to the first mechanism, nationality-based ties have been shown to be an important source of information for migrants regarding the specificities of the host environment (Beaman et al., 2012; Damm, 2009), thus making it easier for foreign newcomers to access the necessary information to do the job effectively. In the case of the PGA TOUR, this relates directly to accessing valuable information about golf course design. The PGA TOUR conditions its courses using specific guidelines[7] (such as deep rough[8] and fast greens[9]), which entail adaptation costs for foreign players (Feinstein, 2011). A foreign newcomer may rely on the experience of his nationality cluster to (1) access valuable information on course design (e.g. identifying the traps to avoid and strategizing about how to play the course) and (2) to identify which tournaments to enter, so that the newcomer enters the tournaments played on courses that fit his playing skills (e.g., some tournaments favor long hitters, while other tournaments favor players with high ball control).

With regard to the second mechanism, nationality-based ties can also be an important source of support for foreigners facing uncertain work environments (Manev and Stevenson, 2001; Ertug et al., 2018) or work settings in which foreigners are underrepresented vis-à-vis natives (James, 2000). Empirical evidence in educational settings show that students who belong to minority groups make friends with others who are ethnically similar because they expect less support from majority networks (Mollica et al., 2003). Similar results are obtained in professional settings – Munshi (2003) find that migrants in the US who share the same origin-community provide more financial

[4] Social networks can also be a source of political connections that bring economic value such as in Schoenherr (2019). However, the role of political connections is not particularly meaningful in our empirical context.

[5] See also Goyal (2007) and Jackson (2008).

[6] The idea that stress, whether financial, psychological or biological, creates "cognitive load" which impairs decision making and has adverse economic consequences, has been examined in several recent studies. Schilbach et. al (2016) provides a concise summary of this literature.

[7] Source: https://pgatourmedia.pgatourhq.com

[8] Area outside the fairway that features thicker grass to penalize imprecise shots.

[9] Area where the hole is located.

support and housing assistance to one another. In the case of the PGA TOUR, this relates directly to accessing the necessary support to overcome the hard reality of a foreigner's daily life in the PGA TOUR. Foreigners who arrive in a host country without mastering the local language may go through a difficult acculturation because of their limited ability to socialize (Zhou & Guillen, 2016). This may be particularly detrimental when reflecting upon the touring life – with many weeks per season on the road, loneliness is a frequent symptom of life on the PGA TOUR (Noer, 2012), potentially affecting players' ability to stay focused. This can be aggravated by the fact that foreigners do not receive the support that local players do, from fans (Anders & Rotthoff, 2014; Garicano, Palacios-Huerta & Prendergast, 2005) or from the press (Burke, 2017), which could make foreign newcomers feel ostracized. In this situation, newcomers may rely on their nationality cluster as a source of support.

3. Social Networks in the PGA TOUR

3.1. PGA TOUR Description

The PGA TOUR is the organizer of the first-tier[10] and the second-tier[11] tours. Both tours feature skilful professionals, but the first-tier tour features the highest-ability players, while the second-tier tour features lower-ability and emerging players. In the fist-tier and the second-tier tours, the season consists of dozens of tournaments. First-tier and second-tier tour tournaments are independent from one another and are held in different venues, every week moving to a new location across the United States[12]. In the first-tier tour, players compete for very large stakes[13], while in the second-tier tour players compete for more modest stakes[14]. As a result, second-tier players are on the edge between making a prosperous living (if promoted to the first-tier tour) or struggling economically (if they never get promoted[15]). Players in the first-tier and second-tier tours who finish in the bottom half of the cumulative prize money ranking at the end of the season lose their card (i.e., license that gives a player the rights to enter tournaments). Players can earn a first-tier or second-tier tour card through the Qualifying Tournament.[16]

Within the context of the PGA TOUR, we build two different social networks. First, we build an overall PGA TOUR network, which describes the historical connections amongst all players (both first-tier and second-tier tours included) regardless of their nationality. Second, we build nationality clusters, which we consider the initial network that foreign newcomers have access to (i.e., each foreign newcomer being connected to the network of his peers from the same nationality). These nationality clusters are sub-networks embedded into the overall PGA TOUR network. This allows us to compute both a density measure for each nationality cluster and a measure of centrality for

[10] Commonly known as PGA Tour.
[11] Commonly known as Web.com Tour.
[12] In the first-tier and second-tier tours there are two to four tournaments per season that take place outside US. Generally, these tournaments take place in Canada or some Central American country.
[13] Average prize per tournament in the first-tier tour in 2016 revolved around US$6 million.
[14] Average prize per tournament in the second-tier tour in 2016 revolved around US$600,000.
[15] Within the 2002-2016 period, among the second-tier tour players who never reached first-tier tour, nearly 40% of them lost their second-tier tour card within two seasons.

[16] The Qualifying Tournament is a multiple stage contest in which hundreds of players (both local and foreign) contend to obtain a card. Players who finish among the top 25 in the Qualifying Tournament are granted a first-tier tour card. Players who finish among the top 26-75 in the Qualifying Tournament are granted a second-tier tour card.

each nationality cluster in the overall PGA TOUR network. We describe each of these two social networks next.

3.2. Overall PGA TOUR Network

In the PGA TOUR, we consider each player to be a node and the existence of a social connection between two players to be a link. We assume two players (regardless of their nationality) are socially linked when they overlap in the same tournament (either in the first-tier or the second-tier tour). An explanation of this assumption is in order. Of all the players who own a PGA TOUR card (250 and 220 players in first-tier and second-tier, respectively), only those who enter[17] a tournament (roughly 140 players, depending on the tournament) are allowed to enter the tournament facilities. There are several areas where players may meet. These range from off-the-course facilities (e.g., locker room, clubhouse, hotel) to on-the-course facilities (e.g., training area, same threesome[18] during a tournament round). Since a tournament lasts a whole week (Monday to Wednesday are training days, and Thursday to Sunday are tournament days), it is reasonable to expect that two players who overlap in a tournament have the chance of getting to know one another. Indeed, when players do not enter a tournament they go back to their respective residences, and therefore their chances of meeting are limited.

In our overall PGA TOUR network, the strength of the link between two players is determined by the number of times they overlapped across tournaments – more tournament overlaps imply more opportunities to interact. After every tournament during the season, new links are established and the strength of existing links change. The PGA TOUR network includes all players who ever had a first-tier or second-tier tour card: that is, a player who lost his card and is no longer actively playing is kept as part of the network, because he may be indirectly connecting two active players. In sum, the PGA TOUR network reflects the links amongst players who have competed or currently compete in the first-tier or second-tier tours.

3.3. Initial Social Network of Foreign Newcomers (Nationality Cluster)

We define the initial social network of a foreign newcomer as the network that his compatriots (same-nationality players), *who are actively playing* either on the first-tier tour or second-tier tour, have built in previous seasons. For instance, although the first Swedish player ever to arrive on the PGA TOUR has no initial social network, if one season later there is another Swedish player arriving at the PGA TOUR, the latter player will have access to the social network that the former Swedish player developed throughout the previous year. This holds provided that the first Swedish player is still active on the PGA TOUR (i.e., still holds a card) by the time the second Swedish player arrives.

4. Empirical Strategy

4.1. Data

[17] Since there are more PGA Tour cards than spots available in a tournament, the PGA Tour has designed, through a set of exemption rules, an eligibility ranking that determines who has priority to enter the tournaments.

[18] For logistical reasons, in order to fit the maximum number of contenders on the golf course, players are grouped into threesomes.

We exploit three rich databases that make it possible to address our research question. First, we use the *ShotLink*® database, which allows us to identify which players have coincided in every single tournament for the period 1996-2016, thus serving as basis to build our PGA TOUR network. Second, we create a database from PGA TOUR's Media Guides (2002-2016), containing player biographic information (e.g., nationality, college attended to). Third, we use the Official World Golf Ranking (OWGR) database, which provides an accurate measure of each player's ability.

4.2. Sample

The overall PGA TOUR network is built from players who have participated in PGA TOUR tournaments, starting in 1996 (first season available) and ending in 2016. Since there have been 1,734 players during that period, our overall PGA TOUR network consists of more than three million data points that change every week (i.e., cumulative tournament coincidences between pairs of players) and accumulate across seasons. Then, we parse the overall PGA TOUR network into 35 nationality sub-networks, from which we create the initial social network of each foreign newcomer (measured at the beginning of his first season in the PGA TOUR) by identifying the network that his veteran compatriots (who are actively playing on the PGA TOUR) have built in previous seasons.

However, the sample with which we run our models strictly consists of foreign newcomers (i.e., non-US citizens[19]) in the first-tier and second-tier tours of the PGA TOUR. Focusing on foreign *newcomers* prevents consideration of foreigners with varying degrees of experience on the PGA TOUR, and thus some of them suffering from the liability of newness while others do not (Mudambi and Zahra, 2007). The period for examining foreign newcomers' survival starts in 2002 (first season in which we have access to players' biographic information) and ends in 2016. Note that because our overall PGA TOUR network is built from 1996, foreign newcomers arriving in 2002 do have an initial social network (i.e., the one built by his same-nationality peers -still holding a card- between 1996 and 2001). As a result, within the period 2002-2016 there were 74 foreign newcomers in the first-tier tour and 191 foreign newcomers in the second-tier tour (see Tables 1 and 2 for a description of nationality and year of arrival of first-tier and second-tier newcomers, respectively). First-tier foreign newcomers are on average 28 years old and have 6 years as professional golfers prior to arrival on the PGA Tour. The average OWGR at time of entry is 230. Second-tier foreign newcomers are on average 27 years old and they turned professional 4 years prior to arrival on the PGA Tour. The average OWGR at time of entry is 579. These statistics indicate that entering the PGA Tour through the first-tier tour is the most frequent path for more talented and internationally experienced golfers.

[Insert Tables 1 and 2 here]

4.3. Dependent Variable

Our dependent variable is the binary variable that reflects whether the foreign newcomer did *not* survive (i.e. did not keep his PGA TOUR card) at the end of his first season[20]. The criterion to keep

[19] There were very few cases of foreigner who had acquired the American citizenship prior to their arrival on the PGA TOUR. We considered them as a local player.

[20] The few cases in which a player did not keep his card because of a voluntary exit or medical leave were identified and excluded from the sample.

the card is the player's rank in the cumulative prize money ranking at the end of the season. In the first-tier tour, every season there are 250 players who have a card that gives them the right to play in first-tier tour tournaments. Of those 250 players, the bottom 125 players, as ranked by cumulative prize money at the season, lose their card and exit the first-tier tour (i.e., are demoted to the second-tier tour). Similarly, every season there are 220 players who have a second-tier tour card. Of those 220 players, the bottom 100 players, as ranked by cumulative prize money at the season, lose their card and exit the second-tier tour. Player turnover is very high in both tours – almost one fourth of players who ever had a PGA TOUR card only got to play one season in the PGA TOUR in their entire career.

There are three reasons why we chose survival at the end of the season as our dependent variable: First, survival is frequently used as a measure to assess foreigners' performance in a host market (e.g., Kronborg and Thomsen, 2009; Mata and Freitas, 2018). Second, focusing on a season-long measure of performance instead of a within-season measure of performance (e.g., tournament-level results), allows us to level out tournament-specific factors that could be influencing the outcomes of a golf tournament, such as the strength of the field (Guryan et al., 2009) or the size of the prize (Kali et al., 2018). Third, not keeping the card at the end of the season is undisputedly a measure of failure because it has hazardous financial consequences for players – losing the card means being demoted to a lower-quality circuit and earning less income.[21]

4.4. Independent Variables: Foreign Newcomer's Initial Network Measures

Our explanatory variables reflect the network attributes of the nationality cluster to which foreign newcomer belongs. In order to calculate the network attributes of each nationality cluster, we follow three steps: First, we artificially separate the overall PGA TOUR network into nationality-based clusters. Figure 1 provides an illustration of nationality clusters within the over PGA Tour network. Second, to calculate how cohesive a nationality cluster is, we compute within-cluster density measures (cluster density and valued cluster density, described below). These within-cluster measures are our proxies for the social cohesion within a nationality cluster and, consequently, of the support that a player may obtain from his same-nationality peers. Third, in order to calculate how central (in terms of closeness, betweenness, eigenvector and degree centrality) a given nationality cluster is in the overall PGA TOUR network, we rotate the network in a way such that the nationality clusters become network nodes (with each such cluster viewed as a node) of the overall PGA TOUR network. Following other papers in the network literature (such as Banerjee et. al. (2019), a more central node is considered better positioned to receive information from other nodes of the network. Thus, our centrality measures are our proxies for the information gathering capabilities of a nationality cluster.

[Figure 1 about here]

Summary statistics for our data are in Tables 3 and 4. Table 5 provides a comparison between the actual network of players used in our study and an equivalent randomly generated network. The measures used are the standard measures of network density and network centralization. Both density and centralization for the actual network are significantly different from a random network.

4.4.1. Within-Nationality-Cluster Density Measures

[21] It costs a minimum of $110,000 per season to compete on the first-tier tour and $75,000 on the second-tier tour (Noer, 2012).

4.4.1.1. Cluster Density

Nationality cluster density was calculated as the proportion of possible ties which are present among the members of the cluster. The value ranges from 0 to 1, with 0 corresponding to the nationality clusters with no relationships among its cluster members, and 1 representing nationality clusters with all possible relationships (Xu et al, 2010). The closer the value is to 1, the more densely connected are the nodes in this nationality cluster. For instance, if there is a nationality cluster of 8 Englishmen in the PGA Tour, and each of the 8 individuals know each other from previous PGA Tour tournaments, then the cluster density of the English nationality cluster would be 1. However, if only 4 Englishmen know each other from previous PGA Tour tournaments, but the other 4 have never coincided with one another on a PGA Tour tournament, then the cluster density of the English nationality cluster would be 0.5.

4.4.1.2. Valued Cluster Density

This measure takes into consideration not only the existence of a linkage between two nodes, as the previous measure did, but also the value of a linkage between two nodes (Hanneman and Riddle, 2005). That is, it takes into consideration the number of times that the members of a nationality cluster have coincided together in previous PGA Tour tournaments. For example, if there are two nationality clusters, German and English, each with 8 individuals who all know one another from previous PGA Tour tournaments, the cluster density for Germans and Englishmen will be the same. However, if the Germans have coincided with one another in more than 5 tournaments, while the Englishmen have coincided with one another in less than 5 tournaments, then the German nationality cluster will have a higher valued cluster density[22].

We suggest that cluster density and particularly valued cluster density reflect the degree of social cohesion within a nationality cluster, and that this social cohesion is associated with the support that players within the nationality cluster provide one another in the face of adversity. There are a couple of arguments that can be made to justify this. First, a high number of tournament overlaps amongst same-nationality peers may reflect a concerted effort from these players to coincide in the same tournaments. It is important to understand that, since players are independent contractors, they have the right but not the obligation to enter a tournament. Entering PGA TOUR tournaments is not cost-free – players must pay for their own travel expenses, plus there are physical and psychological costs (e.g., fatigue, stress) associated with entering a tournament. Since players only enter (on average) in half of the tournaments of the season, when same-nationality peers overlap in many of tournaments, it may be indicative of deliberate coordination on which tournaments to enter, which is in itself a sign of cohesion. Second, a high number of tournament overlaps implies more opportunities for players to interact on and off the course (i.e., stronger social links), and thus to provide one another support to go through the hardships of touring life. This is illustrated by a quote from Spanish golfer Gonzalo Fernandez-Castano, reflecting on how cohesive his nationality cluster was when he was playing in the European Tour and how he missed this support when he transitioned to the PGA TOUR:

[22] Valued cluster density is a measure where the value of the linkage between two nodes is taken into consideration, not only its existence. In other words, this measure represents the ratio of all tie strength that is actually present to all possible ties (Hanneman and Riddle, 2005). Therefore, this measure takes into account how often the members of the group co-occurred together. For instance, if two nationality groups have the same number of players and the same number of connections, their density will be same. However, if the value of the linkages is different, then the valued density of the group with higher value of linkages will be higher.

…It was more like a family travelling together. There are a lot of Spanish players in the European Tour. Most of them they are my best friends. We used to share rooms together, we went for dinner together, we practiced rounds together. So, all of a sudden, I came here to the PGA TOUR and I did know some [other nationality] *guys, but it wasn't the same. That is not what I was used to. It was a little hard …* (Immigrant Archive Project, 2019).

4.4.2. Between-Nationality-Cluster Centrality Measures

4.4.2.1. Closeness Centrality

Closeness centrality of a nationality cluster is calculated as the reciprocal of the sum of the length of the shortest paths between the nationality cluster and all other nationality clusters in the graph (Marchiori and Latora, 2000). Thus, the more central a nationality cluster is, the closer it is to all other nationality clusters. For example, the closeness centrality of the Peruvian nationality cluster would be low if in order to access a very central nationality cluster in the overall PGA Tour network (e.g., Canadians), it needed a high number of intermediaries (i.e., other nationality clusters who are directly connected to the Canadian nationality cluster).

4.4.2.2. Betweenness Centrality

Betweenness centrality is a measure that captures the role of a nationality cluster in allowing information to pass from one part of the overall PGA Tour network to the other. In our case, this measure takes into account how often a nationality cluster connects other nationality clusters (otherwise disconnected) in the PGA Tour network. To compute betweenness for a nationality cluster, the algorithm selects a pair of nodes (nationality clusters) and finds all the shortest paths between those nationality clusters. Then, it computes the fraction of those shortest paths that include the focal nationality cluster (Kourtellis et al., 2015; Freeman, 2010). For example, the betweenness centrality of the Canadian nationality cluster will capture the frequency with which it connects two other nationality clusters (e.g., Colombian and Taiwanese) otherwise disconnected.

4.4.2.3. Eigenvector Centrality

Eigenvector centrality is a complex measure of the influence of a node (i.e., nationality cluster) in the network. Relative scores are assigned to all nationality clusters in the network based on the concept that connections to highly connected nationality clusters contribute more to the score of the nationality cluster in question than equal connections to nationality clusters that are not well-connected with other nationality clusters (Newman, 2006). A high eigenvector score means that a nationality cluster is connected to many nationality clusters who themselves are highly connected in the network. For example, if the Canadian nationality cluster is connected to other well-connected nationality clusters, it will have a higher eigenvector centrality than the Moroccan nationality cluster, which is more connected to other nationality clusters which are themselves less well-connected in the overall PGA Tour network.

4.4.2.4. Degree Centrality

Degree centrality is a simple measure of all the direct connections a given nationality cluster has with other nationality clusters (Freeman, 1979; Hanneman and Riddle, 2005). That is, it reflects the number of times that the individuals in the Canadian nationality cluster have coincided in PGA Tour tournaments with individuals from other nationality clusters.

Admittedly, one could argue that cluster density and valued cluster density might also embody information transmitted within a nationality cluster since they are associated with social interaction. However, since we cannot open this "black-box" we cannot distinguish between the kinds of

support which flow from social cohesion, though it conceivably could be informational as well social and emotional. What seems clear is that the centrality measures (which take each nationality cluster as a node) are conceptually distinct from the within-cluster density measures and embody distinct functions and capabilities. In analysis not reported here, we did consider the interaction of these two sets of variables, which was not statistically significant.

4.5. Controls

4.5.1. Geographic Distance Between Country of Origin and the US

Geographic distance increases migration costs (Tubergen et al., 2004). Foreign newcomers who must travel longer distances between their home country and the US may face extra costs vis-à-vis foreign newcomers whose home country is geographically closer. Geographic distance between country of origin and destination is measured as the distance in kilometres between the capital cities of the origin country and the US. We compute the distance between locations using the Haversine formula, which is commonly used to calculate the distance between points on the surface of a sphere.

4.5.2. English-Speaking Country

Language differences between country of origin and destination increase migration costs (Zhou & Guillen, 2016). Foreign newcomers who arrive in a host country without mastering the local language will incur extra costs of adaptation, such as difficulty to learn about the local culture, socialize, or deal with the press. Accordingly, we created a binary variable that indicates whether the player was born in a country in which English is the official or co-official language.

4.5.3. Ratio of Foreign Newcomers to Incumbents

Beaman (2012) studied refugees resettled in the US labour market and found that an increase in the number of refugees of the same nationality resettled in the same year leads to a deterioration of their employment rate. This is because an increase in the number of refugees may affect competition within the nationality network (e.g., competition for employment information). In line with this finding, we want to control for the annual ratio of newcomers to incumbents (i.e., already existing, active players) in each nationality cluster, as this may affect the competition of newcomers for the resources available in their nationality cluster. For example, if in the 2011 season the South African and South Korean clusters had comparable density and centrality measures, but there were three South Korean newcomers vis-à-vis one South African newcomer, the latter may enjoy an advantage because he may face less competition to access the resources of his nationality cluster. This measure was created by calculating, for every combination of season and nationality cluster, the number of newcomers divided by the number of incumbent players.

4.6. Empirical Model

We model the effect of a foreign newcomer's *initial* nationality-based network on the probability of survival (i.e., keeping the card) at the *end* of the *first* season. Several reasons motivate this choice. First, we focus on the *initial* network because it allows to minimize endogeneity concerns related to the fact that as players perform better throughout the season, they may have better chances of developing a better network (i.e., their improved reputation may give them access to other reputed golfers), thus confounding the effects of social networks on performance. Second, we focus on survival at the *end* of the season because survival occurs at discrete times: then end of the season is the only moment when players retain or lose their card. Thus, although athletes plan performance peaks throughout the season (Pyne et al., 2009), the end of the season is a common reference point

for all PGA TOUR players (Feinstein, 2008). Third, we focus on foreign newcomers' *first* season because it is in the first season that the initial nationality-based social network may play a role: as time (i.e., seasons) passes, foreign newcomers will have the chance to develop their own network, regardless of nationality.

As a result, we have a dependent variable (survival) that is measured at the end of the first season, whereas our independent variables (foreign newcomer's initial network measures) and one control variable (ratio of foreign newcomers to incumbents) are measured at the beginning of the season. The two remaining controls (geographic distance between country of origin and the US, and English-speaking country) are time invariant. We fit a logistic regression to a dataset where we include only foreign newcomers and where there is only one line for every foreign newcomer. Because we use a logistic regression, the interpretation of the coefficients (odds ratios) corresponds to a multiplicative effect on the odds of keeping the card.

5. Results

Tables 3 and 4 provide means, standard deviations, and correlations among the variables. There is no evidence of multicollinearity.

[Insert Tables 3 and 4 here]

The results for the first-tier tour players (models 1 through 6) presented on Table 6, indicate that there is no evidence that any of the initial nationality network measures have an effect on the probability of exiting (i.e., not keeping the card) at the end of the first season. There are two plausible interpretations for this result. The first explanation is that first-tier tour newcomers (after having achieved a direct qualification for the first-tier tour in the Qualifying Tournament) are perceived by other players as very skillful and, consequently, enjoy high status (Van der Vegt et al. 2006). Status is defined as the prestige and respect that individuals enjoy in the eyes of others (Anderson et al., 2006). It has been shown that high-status individuals are more likely to enjoy more social interactions and receive more support than low-status individuals (Van der Vegt et al., 2006; Lount & Pettit, 2012). Thus, it may be that players with high-status, regardless of their country of origin, enjoy a privileged position from which they can access information and support, thus lessening the importance of the initial nationality network. The second plausible explanation has to do with the fact that foreigners who qualified directly into the first-tier tour may not only possess superior golfing skills, but also a superior ability to overcome the attendant hardships they may have to confront. That is, they may be particularly talented in adapting to the specificities of new golf courses and identifying the PGA TOUR courses that fit their playing skills, thus helping them overcome unfamiliarity. Furthermore, first-tier tour players may also be particularly resilient to social pressures in the workplace, as shown in Guryan et al., (2009), including those derived from lack of support from local fans or the solitude that comes with touring life.

[Insert Table 6 here]

In contrast, results for the second-tier tour players (models 1 through 6) presented on Table 7, indicate that valued cluster density has a negative and significant impact (β= -0.064, p=0.05 in model 2) on the probability of exiting (i.e., not keeping the card) at the end of the first season. This implies that players who benefit from high social cohesion in their nationality cluster, exhibit higher chances of surviving at the end of the second-tier tour season. The effect is sizeable, given that a

coefficient of -0.064 means that the odds of exiting the tour are multiplied by exp(-0.064)=0.938 when the variable moves by one standard deviation.

[Insert Table 7 here]

5.1. Post-Hoc Analysis: Within-Season Performance

As we explained on section 4.6, the *end* of the season is the appropriate moment to assess the season performance, because the end of the season is the only point in time when players retain or lose their card. Although the end of the season is undisputedly a common reference point for all players, performing a within-season analysis would allow us to understand whether nationality network measures only matter at end of the first season or, on the contrary, they are present all through the first season (i.e., first-, second-, third-, and fourth-quarter). In order to examine this, we modeled the effect of nationality network measures on the probability of occupying an interim position in the bottom half of the cumulative tournament prize money ranking (threshold that determines who keeps the card) at the end of the first-, second-, third-, and fourth-quarters.

Results for the first-tier tour (not reported here, although available from the authors upon request) showed that there is no significant effect of the initial nationality-based network measures on players' position in the cumulative tournament prize money ranking, and thus on the probability of occupying a provisional exit position.

The results for the second-tier tour (models 1 through 6) are presented in Table 8a and 8b below. Overall, results indicate that valued cluster density has a significant, negative effect on the probability of occupying a provisional exit position at the end of the second-, third-, and fourth quarters. This means that greater social cohesion, which embodies the support from nationality peers, provides foreign newcomers a competitive edge throughout the season. However, we do not find a significant effect of valued cluster density at the end of the first quarter. A plausible explanation for this finding is that valued cluster density, our proxy for social cohesion within the nationality cluster (which we suggest embodies the support provided by nationality peers to the foreign newcomer) takes time to develop. Its effect on a player's performance may therefore not be immediate or sufficiently large to compensate for newcomers' underperformance at the beginning of the season when unfamiliarity is at is peak.

[Insert Table 8a and 8b here]

Results also reveal that betweenness-centrality, eigenvector centrality and degree centrality have a significant negative effect on the probability of occupying a provisional exit position at the end of the second quarter. However, we do not find a significant effect of the centrality measures in the first-, third-, and fourth quarters. One plausible explanation for this result is that the centrality of a given nationality cluster, which proxies the access to information that the nationality cluster provides to newcomers, is valuable mainly in the first half of the season, when the players are most unfamiliar with the host-country competitive environment. However, as the season unfolds, and players have had access to the most relevant information, being part of a more central nationality cluster does not impact a players' performance in the second half of the season.

In the next subsections, we explore the robustness of our second-tier tour findings and consider alternative explanations for the effect of nationality-based initial network on the probability of keeping the card.

5.2. Robustness Tests:

5.2.1. Players Who Went to College in the US

In this robustness test we want to make sure that the effect of the nationality-based initial network on keeping the card (i.e., surviving the season) is not restricted to players who are completely unfamiliar with the US golfing world. More specifically, we want to verify that the nationality network plays an important role on survival *also* among foreigners who previously attended college in the US, and are therefore are likely to be more accustomed to the local competitive environment and for whom the nationality-based initial network may have a negligible effect. College golf in the US, under the umbrella of the National Collegiate Athletic Association, provides student-athletes an opportunity to combine undergraduate studies with the chance of competing in collegiate contests in which they get to know other student-athletes from other universities. Thus, one could argue that if a foreign newcomer in the PGA TOUR has previously gone through college golf in the US, he may have already developed a social network and be more acquainted with local culture, thus lessening the role that the nationality-based initial network plays.

In order to account for this possibility, we rerun our models considering only foreign newcomers who attended college in the US. To do so, we identified whether players attended college in the US based on PGA TOUR's Media Guides[23] (2002-2016). We included one additional control indicating whether the player studied in a US college (binary variable). Results, shown on table 9 below, indicate that the valued cluster density result, although slightly smaller in magnitude vis-à-vis the effect we observed in our previous models, also holds amongst foreign newcomers who attended college in the US. That is, foreign newcomers who have attended college in the US also exhibit greater chances of surviving when they belong to a cohesive nationality cluster.

[Insert Table 9 here]

5.2.2. Player Ability

Second-tier tour players vary in terms of ability. One could argue that our results are mainly driven by the relatively lower-ability players in the second-tier tour – those who possess inferior technical skills and inferior capacity to adapt to the new playing conditions. In order to rule out this possibility, in this robustness test we want to make sure that the effect of the initial nationality network on keeping the card holds regardless of the player's ability. We measure the ability of each player at the time of arrival to the second-tier tour by their position in the Official World Golf Ranking (OWGR), which is a well-established measure of ability (Kali et al., 2018; Miller et al., 2019). The OWGR is calculated based on a two-year rolling period and its calculation is not biased by a player's nationality. [24] The OWGR ranges from 1 (i.e., top of the ranking) to 1,300 (i.e., bottom of the ranking). We transformed the OWGR into a categorical variable because some second-tier tour players are not ranked in the OWGR at their time of entry (i.e., not ranked amongst the top 1,300 world players). The OWGR categories for second-tier tour players are: 1 (ranks <300); 2 (ranks 301–400); 3 (ranks 401–600); 4 (ranks >601). Results, shown on table 10 below, show that the effect of valued cluster density on survival holds after having controlled for players' ability.

[23] Media guides are annual booklets that the PGA TOUR produces for the press and that contain rich biographic information about the first-tier and second-tier tour players.
[24] See http://www.owgr.com/about for more details on how the ranking is calculated.

[Insert Table 10 here]

5.3. Alternative Explanations to the Support from the Nationality Network:

5.3.1. Compatriot Population in the US

Admittedly, one may argue that the density and centrality of a given nationality cluster in the overall PGA TOUR network could be correlated with the size of that nationality's population in the US. For example, the British nationality cluster in the PGA TOUR is more densely connected and central than the Belgian nationality cluster, yet at the same time there are nearly eight hundred thousand British citizens vis-à-vis forty thousand Belgian citizens living in the US. Accordingly, British golfers who migrate to the PGA TOUR may do so partly because they know there is a large network of British compatriots in the US who could provide support and access to valuable information, thus confounding the effects of PGA TOUR's nationality-based initial network on performance.

In order to mitigate this concern, in the test of this alternative explanation we want to verify that our results hold after accounting for the size of compatriot population living in the US by the time a foreign newcomer arrives to the PGA TOUR. This data was downloaded from the MPI Data Hub[25] and provides information about foreigners' population (disaggregated by nationality and year) living in the US, between 2002 and 2016, which is the period under examination. Results, shown on table 11 below, indicate that the size of compatriots' population living in the US does not have a significant effect on probability of exiting the tour. Moreover, valued cluster density continues to be negative and significant.

[Insert Table 11 here]

5.3.2. Home Country's Golf Popularity

Countries vary in terms of golf popularity. Countries where golf has deep roots, such as Scotland, have a better track record of victories and survival in the PGA TOUR. An examination of our sample statistics revealed that some of the nationality clusters with higher density and centrality in the overall PGA TOUR network come from countries where golf is very popular. Thus, one could argue that the better performance (i.e., higher survival rates) of newcomers coming from some nationality clusters is not the result of the initial nationality network, but rather it is the result of their nationality itself. That is, it happens that players coming from countries in which golf is very popular are better prepared to survive in the PGA Tour *and* enjoy a more densely connected and central network than players coming from countries in which golf is less popular. At least two reasons may explain why golf popularity in the home country may provide a competitive edge. First, from a young age, these golfers may have been exposed to the culture of the sport (e.g., different types of course design, history of the different tournaments), which may facilitate the speed at which players adapt to new playing conditions. Second, given the great popularity of golf in their home country, the number of compatriot fans following them in the PGA TOUR is higher, thus helping players to overcome the lack of home-field advantage (Garicano et al. 2005; Sacheti et al. 2015).

In order to control for this possibility, we run models that account for the popularity of golf in each of the countries included in our sample. Specifically, we use a well-known measure of country's

[25] Migration Policy Institute, https://www.migrationpolicy.org/programs/migration-data-hub

golf popularity, which is the total number of golf courses divided by the total population of the country (Royal & Ancient, 2019). At the top of that ranking we find Scotland, with 9,700 citizens per golf course; at the bottom of the ranking we find India, with nearly 5 million citizens per golf course. Results, shown on table 12 below, indicate that the popularity of golf in a does have a significant, negative effect on probability of exiting the tour, but the effect of the support measure is still significant.

[Insert Table 12 here]

6. Discussion

Our goal in this paper has been to examine the impact of a social network on performance in the job. Using a granular dataset on professional golfers in the PGA Tour, we construct a network of connections between players based on overlapping participation in tournaments. Our dataset enables us to construct the overall PGA TOUR network, which describes the historical connections amongst all players (regardless of their nationality) from 1996 to 2016. Each player is considered a node, and a link is created when two players coincide in the same tournament. Since more tournament overlaps imply more opportunities to interact, we value the strength of a link between two players by the number of times the two players have overlapped in tournaments. This gives us a weighted social network that changes every week and accumulates across seasons. By matching up nationality data on the players we are able to parse the social network of all players into nationality sub-networks that are embedded into the larger network. From this we create the initial social network of each foreign newcomer by identifying the network that his vintage compatriots (who are actively playing on the PGA TOUR) have built in previous seasons. These nationality-based clusters are sub-networks that are embedded into the overall PGA TOUR network. We then compute centrality measures for each nationality cluster in the overall network, as well as a network measure of social cohesion within each nationality cluster. Following the assumption of the prior literature on homophily and migrant networks, we assume that a foreign newcomer to the PGA TOUR is able to connect to the nationality sub-network and benefit from both information and support. We use centrality as a measure of the informational capabilities of the nationality cluster and our measure of within-cluster social cohesion as a measure of the support that a newcomer could get from his compatriots during the adversity that a new player faces in the first season of his participation in the PGA Tour.

Our results indicate that our measure of within-nationality social cohesion plays a statistically significant role in increasing the probability that a new foreign player survives the first season. In contrast, the informational capabilities of the nationality cluster do not play any significant role in the probability of survival for a foreign newcomer. This suggests that social networks could play an important role in providing resilience against adversity. While the informational role of social networks has been relatively well-studied, there is much less research on the role of social networks as a source of support. The fact that social and emotional support impacts performance and can have economic consequences is intuitive and well-known but has been hard to quantify. Our paper contributes to filling this gap in the literature. Furthermore, our results suggest an additional interpretation on the role of social networks in the labor market: if we consider our measure of information akin to the role of weak ties, and our measure of support similar to the role of strong ties (Granovetter 1983, Uzzi, 1999), then our findings suggest that strong ties play a more robust role than weak ties for professional success in the job. This could be considered complementary to the notion that weak ties are widely considered more useful in finding a job.

A caveat is that our measure of social cohesion is something of a "black-box." Although our results show that support (derived from social cohesion within a nationality cluster) matters more than

information (derived from the position of a nationality cluster in the overall social network of players), we cannot identify the specific mechanisms through which this support contributes to players' performance. That is, it could be that players who are part of a socially cohesive nationality cluster emotionally support one another by keeping each other company through the loneliness of touring life, or that they provide one another psychological support when they go through bad patches (e.g., not making the cut for several weeks in a row), or both at the same time. The fact that social and emotional support impacts performance and can have economic consequences is intuitive and well-known, but these are mechanisms that remain hard to disentangle from a quantitative standpoint.

Our study arguably provides a "proof of concept" in this regard. A largely qualitative literature in sociology and management consider the value of social structure in the functioning of organizations (Feld, 1981) and social networking in career success (Seibert et. al. (2001)). This is complemented by frequent journalistic accounts of the importance of social networking to professional success (Forbes Magazine, 2019)[26]. Consequently, we believe this study would be helped by additional analyses that aim to study similar questions in other business contexts. In particular, the intriguing question of whether social cohesion is more valuable than the ability to gather and receive information deserves more study.

[26] https://www.forbes.com/sites/biancamillercole/2019/03/20/why-networking-should-be-at-the-core-of-your-career/#7cae2a6f1300

Table 1. Foreign Newcomers Arrived on the First-tier Tour

Nationality	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Newcomers
England	1	1	1	4	1		1					2			1	12
Japan	1	2	1	1	1							1	1		1	9
Sweden		2	2			1				1		2				8
South Korea							1			2	2	1			1	7
Australia	2	2					1								1	6
South Africa					1					2				1	1	5
Argentina		1					1								1	3
Denmark			1			1							1			3
Northern Ireland		1			1				1							3
Canada									1	1						2
India			1												1	2
Ireland				1										1		2
Spain							1						1			2
Wales				1										1		2
Belgium												1				1
Brazil										1						1
Colombia	1															1
Fiji														1		1
Germany												1				1
Italy														1		1
New Zealand		1														1
Norway					1											1
Total	**5**	**10**	**6**	**7**	**5**	**2**	**5**	**0**	**2**	**7**	**2**	**8**	**3**	**5**	**7**	**74**

Source: Calculations based on ShotLink® database. Numbers indicate newcomers per year and nationality. Thus, the same player cannot appear more than once.

Table 2. Foreign Newcomers Arrived on the Second-tier Tour

Nationality	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Newcomers
Australia	6	3	3	6	7	5	4	3	2	4	1	2		3		49
Canada	2		3	1	3	2	2	3	2		4	2	9	2	1	36
South Korea	2		1				1	2		1		5	2		1	15
Argentina		1	1		1	2	1		1	1	1	3	1			13
Colombia		1		1				1	1	2		2		1	3	12
South Africa		1			2	2	1	1	1	1					1	10
England		1		1	1		1	1		1	1			2		9
Mexico				1								1	4		1	7
Sweden	1						3	1	1	1						7
New Zealand	1		1				1			2						5
Scotland				2						1			1			4
Brazil											1			1		2
Chile									1		1					2
China														1	1	2
India		1								1						2
Spain		1				1										2
Bermuda	1															1
Denmark													1			1
Germany												1				1
Guatemala											1					1
Ireland														1		1
Japan			1													1
Paraguay	1															1
Puerto Rico															1	1
Singapore				1												1
Taiwan															1	1
Venezuela								1								1
Wales											1					1
Zambia							1									1
Zimbabwe			1													1
Total	**14**	**9**	**11**	**13**	**14**	**12**	**15**	**13**	**9**	**15**	**11**	**16**	**18**	**11**	**10**	**191**

Source: Calculations based on ShotLink® database. Numbers indicate newcomers per year and nationality. Thus, the same player cannot appear more than once.

Table 3. Summary Statistics and Correlations (First-tier Tour)

	Mean	S.D.	1.	2.	3.	4.	5.	6.	7.
1. Probability of exit	0.41	0.49	1						
2. Cluster Density	0.42	0.21	-0.07	1					
3. Valued Cluster Density	6.74	6.08	-0.07	0.69	1				
4. Closeness Centrality	57.92	2.57	0.27	0.03	-0.13	1			
5. Betweenness Centrality	17.73	16.42	0.31	-0.09	-0.12	0.65	1		
6. Eigenvector Centrality	505,426.56	221,169.54	0.29	0.04	-0.13	0.79	0.48	1	
7. Degree Centrality	2,777.80	1,041.24	0.31	0.01	-0.12	0.68	0.56	0.96	1

n = 74

Correlations of more than 0.30 are significant at 0.01; between 0.27 and 0.30 are significant at 0.05; between 0.24 and 0.27 are significant at 0.10.

Table 4. Summary Statistics and Correlations (Second-tier Tour)

	Mean	S.D.	1.	2.	3.	4.	5.	6.	7.
1. Probability of exit	0.74	0.43	1						
2. Cluster Density	0.51	0.20	-0.12	1					
3. Valued Cluster Density	8.45	5.98	-0.17	0.65	1				
4. Closeness Centrality	56.65	2.19	-0.26	0.24	0.08	1			
5. Betweenness Centrality	18.28	17.76	-0.33	0.13	-0.02	0.76	1		
6. Eigenvector Centrality	210,596.42	100,781.26	-0.38	0.07	0.13	0.46	0.40	1	
7. Degree Centrality	2,179.66	992.94	-0.39	0.02	0.12	0.34	0.34	0.95	1

n = 191

Correlations of more than 0.20 are significant at 0.01; between 0.16 and 0.20 are significant at 0.05; between 0.11 and 0.16 are significant at 0.10.

Table 5. Comparison between the actual network of golf players and a randomly generated network with equivalent nodes.
Most central actor C*, Ci =centrality score of a node, Centralization= 100* Σ(C*-Ci) / Max Σ(C*-Ci)
Here the individual measures of centrality are eigenvector –based centralities.
Density=d_i/N, d_i=degree of node i. Random network measures are averages of monte-carlo simulations.

Golf network	Density	Centralisation	Random	Density	Centralisation
1996-2000	7.314	10.15	1996-2000	1.301	1.887
2001-2005	9.003	10.93	2001-2005	1.388	2.193
2006-2010	9.875	10.84	2006-2010	1.386	2.196
2011-2016	9.217	10.95	2011-2016	1.391	2.194

Table 6. Regression Results for PGA TOUR Exit (First-tier Tour)

DV: Exit First-tier Tour	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Predictors						
Cluster Density	-0.596					
	(1.676)					
Valued Cluster Density		-0.063				
		(0.053)				
Closeness Centrality			-0.018			
			(0.085)			
Betweenness Centrality				-0.001		
				(0.002)		
Eigenvector Centrality					-0.001	
					(0.001)	
Degree Centrality						-0.001
						(0.001)
Controls						
Geographic Distance	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
English-speaking country	-0.879*	-0.906*	-0.844	-0.853*	-0.885*	-0.879*
	(0.527)	(0.533)	(0.559)	(0.546)	(0.526)	(0.527)
Ratio of Newcomers to Incumbents	0.560	0.022	0.721	0.741	0.520	0.697
	(1.186)	(1.18)	(1.058)	(1.032)	(1.120)	(1.160)
AIC	97.37	96.02	97.45	98.24	97.32	97.46
Number of observations	74	74	74	74	74	74

Standard errors in parenthesis. P-values (· p<0.1; *p<0.05; **p < 0.01; ***p < 0.001).

Table 7. Regression Results for PGA TOUR Exit (Second-tier Tour)

DV: Exit Second-tier Tour	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Predictors						
Cluster Density	-1.637					
	(1.026)					
Valued Cluster Density		-0.064**				
		(0.031)				
Closeness Centrality			-0.062			
			(0.052)			
Betweenness Centrality				-0.001		
				(0.001)		
Eigenvector Centrality					-0.001	
					(0.001)	
Degree Centrality						-0.001
						(0.001)
Controls						
Geographic Distance	0.001***	0.001**	0.001**	0.001***	0.001***	0.001***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
English-speaking country	-0.033	-0.053	-0.087	-0.009	-0.010	-0.006
	(0.388)	(0.395)	(0.423)	(0.388)	(0.395)	(0.393)
Ratio of Newcomers to Incumbents	-1.325*	-1.089	-1.001	-1.010	-0.940	-1.002
	(0.759)	(0.681)	(0.692)	(0.681)	(0.679)	(0.692)
AIC	233.52	231.67	234.62	234.22	234.98	234.75
Number of observations	191	191	191	191	191	191

Standard errors in parenthesis. P-values (· p<0.1; *p<0.05; **p < 0.01; ***p < 0.001).

Table 8a. Provisional Exiting Throughout the First Season (Second-tier Tour)

	1st Quarter of the Season						2nd Quarter of the Season					
DV: Exit Second-tier Tour	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Predictors												
Cluster Density	-0.530						-2.556**					
	(0.943)						(1.032)					
Valued Cluster Density		-0.008						-0.077**				
		(0.003)						(0.032)				
Closeness Centrality			0.003						-0.080			
			(0.048)						(0.050)			
Betweenness Centrality				-0.001						-0.003***		
				(0.001)						(0.001)		
Eigenvector Centrality					0.001						-0.001*	
					(0.001)						(0.001)	
Degree Centrality						0.001						-0.001**
						(0.001)						(0.001)
Controls												
Geographic Distance	0.001	0.001	0.001	0.001	0.001	0.001	0.001**	0.001*	0.001**	0.001***	0.001**	0.001**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
English-speaking country	-0.027	-0.081	-0.071	0.001	-0.136	-0.080	-0.091	0.167	0.230	0.166	0.141	0.157
	(0.348)	(0.355)	(0.383)	(0.352)	(0.364)	(0.359)	(0.378)	(0.383)	(0.409)	(0.377)	(0.381)	(0.379)
Newcomers to Incumbents	-0.040	0.207	0.182	0.004	0.318	0.216	-1.110	-0.607	-0.547	-0.774	-0.555	-0.689
	(0.688)	(0.613)	(0.636)	(0.623)	(0.632)	(0.639)	(0.742)	(0.666)	(0.673)	(0.671)	(0.661)	(0.675)
AIC	262.34	262.40	262.40	261.91	262.01	262.42	240.44	240.64	244.34	239.31	243.80	242.67
Number of observations	191	191	191	191	191	191	191	191	191	191	191	191

Standard errors in parenthesis. P-values (· p<0.1; *p<0.05; **p < 0.01; ***p < 0.001).

Table 8b. Provisional Exiting Throughout the First Season (Second-tier Tour)

	3rd Quarter of the Season						4th Quarter of the Season					
DV: Exit Second-tier Tour	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Predictors												
Cluster Density	-2.371**						-1.637					
	(1.036)						(1.026)					
Valued Cluster Density		-0.072**						-0.064**				
		(0.032)						(0.031)				
Closeness Centrality			-0.072						-0.062			
			(0.051)						(0.052)			
Betweenness Centrality				-0.001						-0.001		
				(0.001)						(0.001)		
Eigenvector Centrality					-0.001						-0.001	
					(0.001)						(0.001)	
Degree Centrality						-0.001						-0.001
						(0.001)						(0.001)
Controls												
Geographic Distance	0.001**	0.001**	0.001**	0.001***	0.001**	0.001**	0.001***	0.001**	0.001**	0.001***	0.001***	0.001***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
English-speaking country	-0.234	-0.164	-0.106	-0.228	-0.231	-0.233	-0.033	-0.053	-0.087	-0.009	-0.010	-0.006
	(0.384)	(0.388)	(0.413)	(0.381)	(0.389)	(0.386)	(0.388)	(0.395)	(0.423)	(0.388)	(0.395)	(0.393)
Newcomers to Incumbents	-1.757**	-1.289*	-1.197*	-1.162*	-1.075	-1.121	-1.325*	-1.089	-1.001	-1.010	-0.940	-1.002
	(0.765)	(0.681)	(0.689)	(0.672)	(0.670)	(0.682)	(0.759)	(0.681)	(0.692)	(0.681)	(0.679)	(0.692)
AIC	236.62	236.72	240.06	239.90	240.91	242.67	233.52	231.67	234.62	234.22	234.98	234.75
Number of observations	191	191	191	191	191	191	191	191	191	191	191	191

Standard errors in parenthesis. P-values (· p<0.1; *p<0.05; **p < 0.01; ***p < 0.001).

Table 9. Robustness Test: Players Who Did US College (Second-tier Tour)

DV: Exit Second-tier Tour	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Predictors						
Cluster Density	-0.864					
	(1.265)					
Valued Cluster Density		-0.058**				
		(0.030)				
Closeness Centrality			-0.045			
			(0.072)			
Betweenness Centrality				-0.002		
				(0.002)		
Eigenvector Centrality					-0.001	
					(0.001)	
Degree Centrality						-0.001
						(0.001)
Controls						
Geographic Distance	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
English-speaking country	-0.103	0.291	0.246	0.287	-0.371	0.357
	(0.495)	(0.907)	(0.528)	(0.507)	(0.530)	(0.524)
Ratio of Newcomers to Incumbents	-0.432	-0.720	-0.355	-0.455	-0.469	-0.534
	(1.016)	(0.921)	(0.981)	(0.885)	(0.898)	(0.919)
AIC	123.49	120.15	123.55	122.64	122.48	122.46
Number of observations	97	97	97	97	97	97

Standard errors in parenthesis. P-values (· p<0.1; *p<0.05; **p < 0.01; ***p < 0.001).

Table 10. Robustness Test: Accounting for Players' Ability (Second-tier Tour)

DV: Exit Second-tier Tour	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Predictors						
Cluster Density	-1.515					
	(1.091)					
Valued Cluster Density		-0.065**				
		(0.034)				
Closeness Centrality			-0.049			
			(0.056)			
Betweenness Centrality				-0.001		
				(0.001)		
Eigenvector Centrality					-0.001	
					(0.001)	
Degree Centrality						-0.001
						(0.001)
Controls						
Geographic Distance	0.001*	0.001	0.001*	0.001*	0.001*	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
English-speaking country	-0.153	-0.088	-0.076	-0.126	-0.091	-0.099
	(0.412)	(0.418)	(0.450)	(0.413)	(0.418)	(0.416)
Ratio of Newcomers to Incumbents	-1.618**	-1.462*	-1.275*	-1.429*	-1.424*	-1.487*
	(0.822)	(0.752)	(0.756)	(0.746)	(0.751)	(0.766)
Additional control						
Players' Ability	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
AIC	213.96	212.15	215.11	213.68	213.86	213.73
Number of observations	191	191	191	191	191	191

Standard errors in parenthesis. P-values (· p<0.1; *p<0.05; **p < 0.01; ***p < 0.001).

Table 11. Alternative Test: Compatriots in the US (Second-tier Tour)

DV: Exit Second-tier Tour	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Predictors						
Cluster Density	-1.561					
	(1.059)					
Valued Cluster Density		-0.063**				
		(0.031)				
Closeness Centrality			-0.057			
			(0.053)			
Betweenness Centrality				-0.002		
				(0.002)		
Eigenvector Centrality					-0.001	
					(0.001)	
Degree Centrality						-0.001
						(0.001)
Controls						
Geographic Distance	Yes	Yes	Yes	Yes	Yes	Yes
English-speaking country	Yes	Yes	Yes	Yes	Yes	Yes
Ratio of Newcomers to Incumbents	Yes	Yes	Yes	Yes	Yes	Yes
Additional control						
Compatriots in the US	-0.001	-0.001	-0.001	0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
AIC	235.43	233.45	236.47	236.21	236.73	236.61
Number of observations	191	191	191	191	191	191

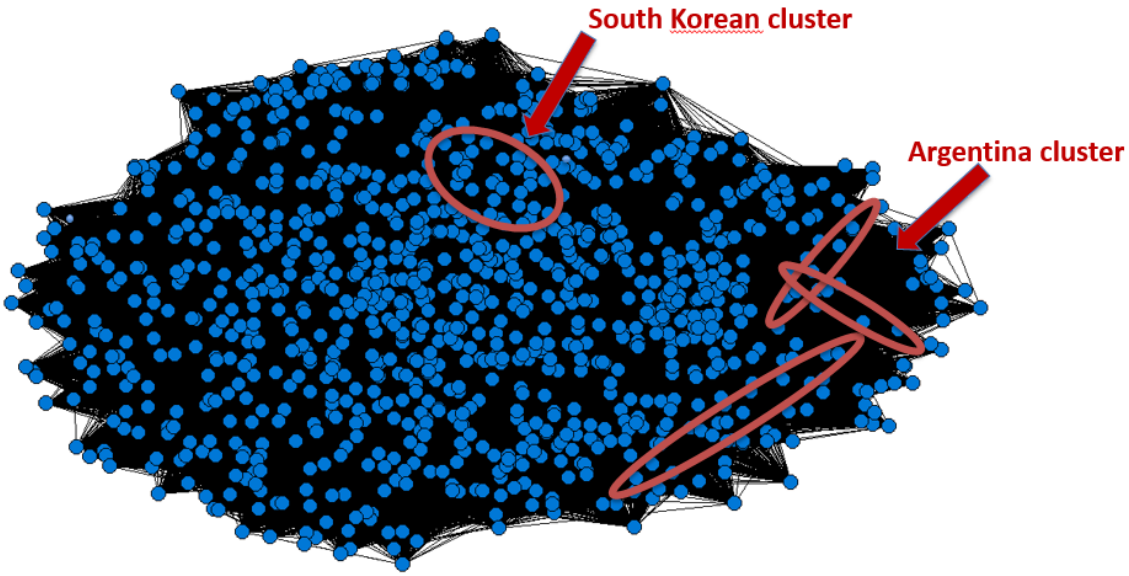
Standard errors in parenthesis. P-values (· p<0.1; *p<0.05; **p < 0.01; ***p < 0.001).

Table 12. Alternative Test: Home Country's Golf Popularity (Second-tier Tour)

DV: Provisional Exit	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Predictors						
Cluster Density	-1.476					
	(1.059)					
Valued Cluster Density		-0.048*				
		(0.030)				
Closeness Centrality			-0.045			
			(0.055)			
Betweenness Centrality				-0.002		
				(0.001)		
Eigenvector Centrality					-0.001	
					(0.001)	
Degree Centrality						-0.001
						(0.001)
Controls						
Geographic Distance	Yes	Yes	Yes	Yes	Yes	Yes
English-speaking country	Yes	Yes	Yes	Yes	Yes	Yes
Ratio of Newcomers to Incumbents	Yes	Yes	Yes	Yes	Yes	Yes
Additional control						
Country's golf popularity	-19.201**	-16.130**	-18.934**	-19.598**	-19.004**	-18.898**
	(8.922)	(8.986)	(8.929)	(8.832)	(9.011)	(8.919)
AIC	230.52	230.25	231.76	230.92	232.13	231.89
Number of observations	191	191	191	191	191	191

Standard errors in parenthesis. P-values (· p<0.1; *p<0.05; **p < 0.01; ***p < 0.001).

Figure 1. Network structure and nationality clusters



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