12-2023

The Strength of Community: The Role of Social Support Networks in Sport Officials' Retention

Jacob K. Tingle
Trinity University, jtingle@trinity.edu

Brittany L. Jacobs

Matthew Katz

Stacy Warner

The Strength of Community: The Role of Social Support Networks in Sport Officials' Retention

ABSTRACT

Previous researchers have indicated that a sense of community and social support are vital to referee retention; however, little is known about the connection between specific characteristics of sports officials' networks and retention. To better understand the sports officiating shortage, researchers explored the social support networks of 116 referees utilizing egocentric network analysis. The authors suggest that retention of sports officials depends on the interpersonal ties and network structures within which the referees are embedded. Specifically, resulting hierarchical models confirmed that Retention Relationships among officials is a multilevel phenomenon, and that Outside Communication and Community were vital network characteristics which fostered Retention Relationships. Network Size, Tenure, and the Officiating Level also were significant when considering an official's network and its impact on retention. Areas for future research and suggestions for referee managers are presented.

Keywords: *sense of community, referee, egocentric networks, network analysis*

**The Strength of Community: The Role of Social Support Networks in Sport Officials'
Retention**

Staff recruitment, retention, and development are essential to organizational success

(Masteralexis et al., 2012). And, in sport, officials (also called referees, umpires, and judges) are

key personnel essential to organized competition. Sports officials' jobs are complex and multi-

faceted, requiring that they work in teams (Kellett & Warner, 2011), manage coach/player

relationships under mostly contentious conditions (Anshel & Weinberg, 1995; Rainey & Hardy,

1997; Webb et al. 2020), and cope with significant abuse, aggression, and in some cases violence

(Devis-Devis et al., 2021). For the individual referee, gendered (Nordstrom et al., 2016; Tingle et

al., 2014) or generalized abuse (Dawson et al., 2022) has been associated with stress (Anshel et

al., 2013), burnout (Webb, 2018), and negative mental health outcomes (Tingle et al., 2022).

Because of these persistent challenges, officials are dropping out in high numbers (Jacobs et al.,

2020; Niehoff, 2022). Despite concerns about rates of attrition, many officials are retained and

have long, sustained careers. Examining current officials' social support and sense of community

through their social networks is a key to understanding officials' job satisfaction (Giel & Breuer,

2020) and motivation to persist (Zvosec et al., 2021). Specifically, exploring sports officials'

egocentric or personal connections to other officials is vital to understanding retention.

Recently, Ridinger, Kim et al. (2017) developed the Referee Retention Scale to learn why

officials continue in the role. Others have explored referee's sense of community (Kellett &

Warner, 2011; Warner, Tingle et al., 2013), perceived organizational support (Livingston et al.,

2020), and engagement and authenticity (Kim et al., 2022) as means to improve retention. A

nascent line of research has begun exploring the relationship between working as a referee and

well-being (Kim et al., 2022; Tingle et al., 2022; Webb et al., 2021). While there appears to be a

direct link between a sports official's stress and negative mental health outcomes (Gorczynski &

Webb, 2021), it also appears that a strong sense of community (Kim et al., 2022; Ridinger, Kim et al., 2017) and social support networks could mitigate those outcomes (Kellett & Shilbury, 2007; Phillips & Fairley, 2014; Warner, Tingle et al., 2013). Sports officials' social support and the strength of an officiating community could, then, be a key to helping sport organizations better retain officials. As Katz et al. (2019) indicated, social support is deeply connected to the strength and structure of interpersonal networks (Wellman & Wortley, 1990). Social support is not experienced in isolation; rather in community which is contingent upon both the structural elements (Hancock et al., 2015) and characteristics of one's colleagues (Giel & Breuer, 2020; Hancock et al., 2022) and social networks (Song et al., 2011). Other scholars have found that better recruitment (Bright et al., 2022), training, and continuing education opportunities (Kellett & Warner, 2011; Tingle et al., 2014; Warner, Tingle et al., 2013) coupled with more intentional and direct support systems from referee administrators (Ridinger, Kim, et al., 2017; Ridinger, Warner, et al., 2017) can prevent drop out, and lead to more satisfied (Giel & Breuer, 2020), self-efficacious referees (Lopez-Aguilar et al., 2021). To better support referee retention, continued research in this area remains a priority. Thus, the purpose of this study is to analyze how officials' social networks affect their retention.

Literature review

Referee Support Networks

Previous research has focused on individual referees and their own motivators/demotivators, often neglecting the social environment in which these officials are tasked to operate. Adopting an ecological perspective, as suggested by Livingston and Forbes (2016), we acknowledge that officials do not operate in a vacuum and, thus, social and administrative networks impact their officiating outcomes (Zvosec et al., 2021). From a social standpoint, officials may find support both within the officiating community or external to their

specific role (Fowler et al., 2019; Phillips & Fairley, 2014). After a game, officials may seek developmental support, rule clarification, or commiseration with other officials experiencing similar stressors (Forbes & Livingston, 2013; Kellett & Shilbury, 2007). Or, in other instances, they may find support from those external to the officiating community (i.e., friends, family) to be more impactful. While the support received in each instance may differ, the importance of these support networks and the type of support received is paramount to the understanding of officiating retention.

Beyond the social support that may exist for an official, administrative support networks also influence the social environment in which they operate. Specifically, Warner, Tingle et al. (2013) noted that cumbersome policies, inadequate training/mentoring, lack of community, and lack of administrator considerations played a role in sport officials quitting the profession. This was later confirmed by Ridinger, Kim et al. (2017) who found these factors created a demotivating environment. These markers reinforce the importance of various support structures in officiating retention and inherently link officiating discontinuation with a lack thereof (Livingston & Forbes, 2016).

Sense of Community and Sports Officials

In the last fifteen years, an important line of research has examined the relationship between sense of community and retention in a variety of sport settings (Kellett & Warner, 2011; Warner & Dixon, 2011, 2013). Sense of Community, defined as the "perceived sense of belonging to a supportive community of officials" (Ridinger, Kim et al., 2017, p. 518) has been identified as a contributing factor in referees' decisions to remain active (Livingston & Forbes, 2016). In a foundational study, Kellett and Shilbury (2007) interviewed Australian Rules football umpires and found that positive social interactions allowed the participants to reframe abuse and served as an important factor in their retention. In another foundational study, Kellett and Warner

(2011) established that lack of concern from administration, perceived inequity of pay and resources, competition, and a common interest amongst the umpires all, positively or negatively, impacted the sense of community the umpires experienced. Building on those foundations, the Referee Attrition Model was developed to explore reasons officials leave the profession (Warner, Tingle et al., 2013). In that study, referees described 10 factors that manifested across three sport development stages (referee recruitment, referee retention, and referee advancement) as reasons for leaving the profession. A subsequent study of U.S. female basketball officials revealed that their failure to connect with their officiating community led to their discontinuation (Tingle et al., 2014). Additionally, Ridinger (2015) found that greater support from administrators led to a strong sense of community which allowed officials to overcome other negative constraints.

Attempting to broaden the finding of these qualitative studies, Ridinger, Kim et al. (2017) developed the Referee Retention Scale, which measured factors most salient to referee retention. Based on data from more than 1,200 U.S. officials, the model indicated that Sense of Community combined with Administrator Consideration, Intrinsic Motives, Mentoring, Lack of Stress, Remuneration, and Continuing Education explained more than 67% of the variance to predict sports officials' retention. When exploring Sense of Community in sport settings, Warner and Dixon (2016) stated that: "A strong sense of community is fundamental to one's overall life quality, well-being, and health . . ." (p. 45). Thus, it is not surprising that recent researchers also have found a connection between sports officials' sense of community, mental health, and psychological well-being (Kim et al., 2022; Tingle et al., 2022). Such foundational work points to the continued need to understand sports officials' social networks.

Egocentric Networks and Social Support

With a few exceptions, sports officiating is an activity that occurs in a group context. According to Ashmore et al. (2004) group membership is formed as a means of distinction from

other groups. The stronger the differences between groups, the greater the likelihood for an 'us'

versus 'them' or in-group/out-group phenomenon to develop (Tajfel, 1978). As a result, scholars

have explored the referee experience through the Social Identity Theory lens and found a

connection between social identification as a group member and likelihood of being retained as a

referee (Zvosec et al., 2021). Jacobs et al. (2020) found that the more rugby referees were

perceived to belong to the *out-group* within the sporting environment, the greater likelihood for

them to report abuse from players, coaches, and spectators. Previous researchers also have

indicated that one's social identity impacts both emotional responses and behaviors, such as

continuing to officiate (Oja et al., 2020; Zvosec et al., 2021). While social identities may differ in

strength and content (e.g., 'rugby official', 'NCAA referee', 'female official'), they are derived

from the groups to which an individual belongs (Scheepers & Ellemers, 2019). As revealed in

other studies using egocentric network analysis, one way to better understand the strength and

content of these officiating *in-groups* is through an analysis of their social networks.

Sports officials rarely work alone, they are consistently interacting with other officials

and such interactions consequently form a network – a collection of individual actors (i.e., egos)

with relationships (i.e., ties) between them (Borgatti et al., 2022). When individuals operate

within a network, the structure and characteristics of the network affect the attitudes, behaviors,

and outcomes of the individual embedded within the network (Wasserman & Faust, 1994). And

while many social science approaches examine individual-level attributes in isolation, the

network approach emphasizes the local (and global) social environment within which individuals

are embedded. Social support, for example, is one such scholarly line of inquiry that has long

been examined via a network lens (Perry et al., 2018). In network approaches to social support,

scholars often assess the quality and quantity of interpersonal ties that yield different types of

social support (e.g., Smith & Christakis, 2008) or how patterns of relationships influence the flow

of social support between individuals (Wellman & Wortley, 1990). In sport settings, a network

approach has been successfully used to explore team cohesion (e.g., Anderson & Warner, 2017;

Warner et al., 2012) and fan relationships (e.g., Katz et al., 2019; Katz et al., 2020). A network

approach will be used in this study to better understand sports officials' social support networks

with the ultimate goal of providing insights on retaining more officials.

Theoretical Framework – Network Theory

Network science often serves as both method and theory (Perry et al., 2018). In the

present study, egocentric network analysis provides both a methodological and theoretical

framing. Borgatti and Halgin (2011) differentiated between two key types of network theorizing:

network theory and theory of networks. Network theory principally is concerned with the

consequences of network variables, while theory of networks focuses on the processes that

determine network characteristics (Borgatti & Halgin, 2011).

Network inquiries into social support tend to utilize an egocentric network approach –

one of the two principal forms of inquiry in the network tradition. According to Perry et al.

(2018), Egocentric Network Analysis (ENA) allows researchers to focus on both the individual

and the social environments surrounding them. Specifically, an individual's egocentric network

includes themselves (labeled ego), those to whom they are connected (alters), and ties between

alters (alter-alter ties; Crossley et al., 2015). Katz et al. (2020) described the importance of the

ego and alter relationship, "The interactions and ties an ego shares with various alters [in their

network] impact the ego's opportunities and experiences" (p. 294). Previous researchers have

indicated a positive connection between sense of community and retention (Kellett & Warner,

2011; Ridinger, Kim et al., 2017) and low levels of perceived organizational support with

attrition (Livingston & Forbes, 2016). However, scholars have yet to explore sports officials'

egocentric networks to understand how social support, sense of community, and retention are linked.

Utilizing a network theory approach, we aim to uncover how the characteristics of officials' egocentric networks yield retention behaviors. Based on network theory and existing sports officiating literature, we hypothesize that an official's decision to continue officiating is affected by the social structure within which their role as officials is embedded. Specifically, we aim to better understand referee's social support by addressing the following research question: What are the characteristics of sports official's relationships and networks that affect retention?

Method

Participants and Procedure

To examine the effects of egocentric networks on officials' retention, after obtaining Institutional Review Board consent from the lead author's university, the research team recruited self-identified officials via message boards, listservs, Facebook and Twitter groups dedicated to officials, as well as sent direct messages to various officiating organizations (e.g., Colorado High School Officials Association, Georgia Officials Athletic Association). Eligibility for the study required that participants be an active sports official over the age of 18. Data were collected using the Qualtrics survey software, and the title page of the survey included a detailed consent form. Generating samples in egocentric network analysis mirrors the requirements of traditional quantitative surveys. In other words, egocentric studies are not burdened with the same sample requirements (i.e., high response rates, bounded sample populations) as sociocentric network studies (McCarty et al., 2019). As Perry et al. (2018) suggested, recruiting participants in egocentric studies includes finding a set of actors sampled from the target population. At the conclusion of data collection, 158 participants willingly completed the survey instrument. After removing incomplete responses from the dataset, we moved forward with a usable sample of 116

participants. Sample size in egocentric network analysis, particularly when utilizing hierarchical linear modeling, requires a different set of criteria than most standard statistical techniques because of the structured nature of hierarchical data. Because the sample was larger (Katz et al., 2020) or similar (Cocco et al., 2021) in sample size to previous multilevel egocentric studies in sport management and previous researchers reported standard sample sizes at Level-2 of around 50 participants, 116 respondents was appropriate for the purposes of our study (c.f., Maas & Hox (2005). Clustered within the 116 Level-2 egos were 350 Level-1 alters. Full descriptive data of our sample is presented in Table 1.

[Please Insert Table 1 Here]

Instrumentation

Network Survey Design

The egocentric survey was designed based on the name generator approach, the most popular and best understood data collection strategy within egocentric network analysis (Perry et al., 2018). Within a name generator, participants (i.e., ego) were asked to list the names of other individuals (i.e., alters) with whom they share a particular relationship (i.e., tie). As an example, if a participant named "Brady" began the survey, Brady would be asked to list the names of individuals to whom they turned to for support related to officiating. Because the relationship of interest in our study was sport official support networks, we instructed participants to list the names of people to whom they turned to for support related to officiating. To provide further direction, we included examples such as, "people you call after a tough game", "someone you reach out to for rules interpretations", or "someone whose counsel you seek regarding professional opportunities." Participants were permitted to utilize nicknames, first names, or initials for the given alters, so long as they recognized each name listed for follow-up questions. Allowing initials or nicknames removes any perceived stigma in providing identifiable

information about one's colleagues to researchers (Perry et al., 2018). The name generator instrument provided five blank spaces for potential alters, but participants were not given a specific minimum or maximum number of alters to list.

Once the participant (i.e., ego) provided names from the name generator item above (i.e., alters), the participants were then asked a series of questions about each alter, known as name interpreters or more commonly as alter attributes. Continuing with the hypothetical example with participant "Brady", assume that "Brady" listed "Pat", "RJ", and "Sam" in the name generator, Brady (i.e., ego) was then asked a series of questions about "Pat" followed by the same questions about "RJ", and then the same questions about "Sam." Our survey included eight questions about each alter (i.e., "Pat", "RJ", and "Sam"). Each question is presented in Table 1. First, two demographic questions about each alter (e.g., gender identity, race/ethnicity) were asked and those were followed by questions about the relationship between ego and alter. The first ego-alter ties, which later served as the dependent variable in our hierarchical linear modeling, measured how influential the ego-alter tie was in their decision to continue to officiate (i.e., Retention Relationship). As detailed in Table 1, Retention Relationship was measured by asking the participant to rate their level of agreement (7-point Likert scale anchored by "Strongly Agree" and "Strongly Disagree) with the following statement: "My relationship with alter is part of the reason I continue to officiate." Other ego-alter tie questions measured how often they communicate in ways not related to officiating (i.e., Outside Communication), how often they seek advice related to officiating (i.e., Officiating Advice), how often they communicate about officiating stressors like fan abuse or bad calls (i.e., Stressors), whether their relationship makes the participant feel a part of the larger officiating community (i.e., Community), and finally to classify each alter as a fellow official or family/friend. These questions were drawn from existing officiating literature, which supports communication (e.g., Cunningham et al., 2018), advice

(Livingston & Forbes, 2017), stressors (e.g., Anshel et al., 2013; Anshel & Weinberg, 1995; Jacobs et al., 2020; Rainey & Hardy, 1997), and community (e.g., Ridinger, 2015; Warner et al., 2013) as elements that impact officiating outcomes. Participants were asked to answer those eight questions for each alter provided in the name generator (i.e., Brady was asked the same questions about "Pat", "RJ", and "Sam").

The next section asked the participants (i.e., ego) to answer questions about the relationships between the various alters provided in the name generator. More specifically, participants were asked, to the best of their knowledge, if each alter listed has a professional relationship with the other alters in their network. For example, using the previous hypothetical alter names, the first alter-alter question asks Brady "does Pat have a professional relationship with RJ" and the second alter-alter questions would ask "does Pat have a professional relationship with Sam." Alter-alter tie information is necessary for examining the structural characteristics of each egocentric network and whether those structural characteristics influence Retention Relationships. With the alter-alter ties, by definition, the entire range of network statistics (e.g., Network Density) are available for each egocentric network. Such egocentric network statistics are used as Level-2 variables, as they are specific to each egocentric network and differ across Level-2 groupings.

The final section of the survey asked participants questions about themselves (i.e., ego attributes). These ego attribute questions included demographic information (e.g., Ego Gender Identity, Ego Race/Ethnicity), and specific questions about their officiating careers (i.e., Primary Officiating Sport, Geographical Region, Primary Level of Competition). After completing the ego attribute questions, the survey was complete. With alters, alter attributes, alter-alter tie, and ego attributes, the dataset was then analyzed.

Network Variables

After the participants completed the surveys, we used the survey data to calculate a series

of network variables to use in the subsequent data analysis. We first imported the survey data

into E-Net (Borgatti, 2006), a software program designed specifically for egocentric network

analysis (Halgin & Borgatti, 2012). The raw data were reformatted into three different matrices

corresponding to ego attributes, alter attributes, and alter-alter ties. Those three matrices were

then reformatted to a single VNA file uploaded using E-Net's row-based filing format in

accordance with the guidelines presented by Halgin and Borgatti (2012). Once the data were

formatted in E-Net, we were able to calculate network variables for each participant. Perry et al.

(2018) identified three primary families of egocentric measures as Network Size, Composition,

and Network Density.

Network size is perhaps the most basic measure of an egocentric network, and is often an

influential predictor of outcomes like social integration, social capital, and social support (Perry

et al., 2018). Crossley et al. (2015) refer to network size as tie central tendency, noting how

egocentric networks may vary greatly in size and that variance is often strongly correlated with

outcome variables. Composition refers to the characteristics or different kinds of alters within an

egocentric network, allowing researchers to examine concepts like heterogeneity (i.e., alter-alter

similarity). To measure heterogeneity, Blau's index to measure the heterogeneity (or diversity) of

the alters in a particular network based on relationship classification (i.e., friend/family or fellow

official), gender, and race was utilized. Blau's index is the most common measure of network

heterogeneity when examining categorical data (Perry et al., 2018). Finally, to examine the

structure of each egocentric network, network density, which is the number of ties among alters

in a network divided by the number of possible ties, was calculated. Network density is the most

commonly used measure of egocentric structural characteristics (Perry et al., 2018). As a further

measure of network structure, we also examined structural holes based on Burt's (1992)

influential work. A full list of variables is presented in Table 1.

Data Analysis

After the network variables were calculated in E-Net, the data were reformatted for

hierarchical linear modeling (HLM). HLM refers to a statistical framework for examining nested

relationships in situations where the research setting involves hierarchically structured data.

Sometimes called multilevel models or mixed models, the most common examples of

hierarchical data structures involve students in classrooms or perhaps patients of the same doctor.

In these examples, students share variance as they learn from the same teacher and patients may

share variance as they are treated by the same doctor. In explaining variance in outcomes for

those students or patients, independent variables conceptually exist at both the student and

teacher level of analysis. The same type of structured data exists in numerous settings, ranging

from psychology (Woltman et al., 2012) to behavioral medicine (Matsuyama, 2013).

Within egocentric network analysis, a hierarchical data structure exists where alters are

nested in ego. Consider the case once again of a hypothetical participant named Brady who listed

"Pat", "RJ", and "Sam" as alters. When Brady (i.e., ego) lists "Pat", "RJ", and "Sam" as

individuals who the participant/Brady calls after a tough officiating game, those alters are nested

under the same ego. Because of that hierarchical structure, research questions that examine

outcomes at the alter-level must utilize statistical methods for examining hierarchical data

(Crossley et al., 2015; McCarty et al, 2019; Perry et al., 2018). If scholars want to examine how

ego-alter relationships influence ego's decision to continue officiating, theoretically there are

characteristics of Brady (i.e., ego) as well as characteristics of each alter (i.e., Pat versus RJ

versus Sam) that affect Brady's decision to continue officiating. Scholars simply could not

examine the characteristics of Brady; nor could they examine Pat, RJ, and Sam as independent

observations because each is nested within Brady's egocentric network. Consequently, when the research question involves outcomes at the alter-level of analysis, hierarchical modeling is necessary to avoid biased estimates and standard errors (Perry et al., 2018).

To utilize multilevel modeling with egocentric network analysis, whereby alters (Level-1) are nested in ego (level-2), Perry et al. (2018) outline three conditions that must be met. First, the dependent variable of interest must occur at the alter-level of analysis. Second, ego observations should be independent of other participant responses. And third, individual egocentric networks should not substantially overlap. Our dataset and research goals satisfy these requirements, and thus multilevel modeling was an appropriate statistical analysis.

The first condition outlined by Perry et al. (2018) includes an important methodological distinction between examining ego-level outcomes and alter-level outcomes. If the research questions involve an outcome that occurs at the ego-level of analysis, then standard ordinary least squares regression is appropriate. For example, if the Outside Communication variables from Brady's (i.e., ego) relationship with Pat, RJ, and Sam were all aggregated into a "Total Outside Communication" variable and used to explain how enjoyable Brady finds officiating, scholars could use standard OLS regression. In that example, the researcher is not interested in the difference between the alters (i.e., Pat, RJ, and Sam), but rather some aggregated measure of Brady's egocentric network. That is not the case in the present study, where our overarching research question seeks to examine differences between the various ego-alter relationships. Therefore, multilevel modeling is both empirically appropriate and theoretically necessary.

To recap the data analysis strategy: because our dataset included alters nested in ego and our research question involved an outcome at the alter-level, we utilized hierarchical linear modeling. Such an approach is consistent with methodological and theoretical best practices (Crossley et al., 2015; McCarty et al, 2019; Perry et al., 2018) for examining egocentric network

analysis. HLM allows scholars to estimate how Level-1 variables and Level-2 variables affect a Level-1 outcome variable (Raudenbush & Bryk, 2002). In the current study, we use HLM to model how alter-level characteristics (e.g., Outside Communication) and ego-level characteristics (e.g., Network Size) explain variance in the dependent variable (i.e., Retention Relationship).

Results

Following well-established processes for examining egocentric networks specifically (McCarty et al., 2019; Perry et al., 2018) and HLM more generally (Raudenbush et al., 2011), our modeling was conducted by testing the level of dependence within the structured dataset. With Retention Relationship serving as the dependent variable, the viability of multilevel modeling was first tested by running an unconstrained model. Using maximum likelihood estimation within the statistical program HLM 8.0, an unconditional model designed to estimate the partitioning of variance at Level-1 and Level-2, resulted in a significant model ($\chi^2 = 659.60$, p<.001). The significant null model supported rejecting the null hypothesis that residuals in the model are independent, confirming the need for hierarchical linear modeling to address clustered dependencies. We also utilized the results of the null model to calculate the proportion of variability in the dependent variable between units; a statistic referred to as intraclass correlation (ICC; Rabe-Hesketh & Skrondal, 2012). The ICC statistic is used only in the null model to confirm the appropriateness of multilevel modeling. By dividing the between-group variance ($\tau 00$) by the sum of the between-group variance and within-group variance ($\sigma 2$) based on the null model, the resulting ICC was .1646 indicating that roughly 16.46% of the variance in Retention Relationships occurs at the ego level with the remainder occurring at the alter-level of analysis. Based on the significant null model and the ICC, HLM was an appropriate analytical strategy and we continued building the model.

The next step in our model development was explicitly testing the relationship between alter-level variables and Retention Relationship. A random coefficient model that examined mean differences across alters nested in the same ego was created. In other words, we tested how differences among alters, while controlling for ego variance, influenced Retention Relationships. Utilizing a chi-square deviance test approach, each alter-level independent variable was included and tested as to whether its inclusion significantly improved the fit of the model. As an example, we first included Outside Communication as a group-centered variable in the random coefficient model which significantly increased model fit based on the chi-square deviance test ($\chi^2 = 18.57$, p<.001). Using the same model fitting technique, the random coefficient model included Advice, Stressors, and Community as group-centered variables. Family/Friend and Mentor were included as non-centered variables, thus Fellow Official served as the reference variable. Alter BIPOC was also included as a non-centered variable because it is binary. The final random coefficient model was significant, $\chi^2(110) = 958.48$, p <.001, and a deviance test confirmed an improved fit over the unconditional model, $\chi^2(6) = 95.60$, p < .001. Using the random coefficient model results, we then examined the variance explained in Retention Relationship through the inclusion of alter-level variables by dividing the difference between the null model within-group variance ($\sigma^2_{Null} = 1.05$) and Level-1 model within-group variance ($\sigma2$ Level-1 = .71) by the original null model within-group variance (σ^2_{Null}). Based on that equation, the random coefficient model explained an additional 31.89% of the available variance compared to the null model.

To examine the effect of ego-level variables on Retention Relationship, the alter-level variables and ego-level independent variables were removed. Using the same model-fitting process as the random coefficient models, the final ego-level model included Tenure, Network, and Network Density as grand-mean centered variables. Medium (officiating) Level and Low (officiating) Level were entered as binary variables, with High (officiating) Level serving as the

reference group via its exclusion from the model. Finally, Ego BIPOC was also entered as a non-centered binary variable. Our final ego-level model was significant, $\chi2(86) = 459.08$, $p < .001$, and significantly improved the model fit compared with the null model, $\chi2(6) = 95.84$, $p < .001$. Using the ego-level model results, the variance explained in Retention Relationship through the inclusion of ego-level variables by dividing the difference between the null model between-group variance and Level-2 model between-group variance by the original null model between-group variance (σ^2_{Null}) was then examined. Based on that equation, the ego-level model explained an additional 28.62% of the available variance compared to the null model.

In the fourth and final model, both ego- and alter-level variables with Retention Relationship remaining the dependent variables were included. All binary variables were entered non-centered, alter-level variables were group-centered, and ego-level variables were grand centered. The final combined model was significant, $\chi2(86) = 666.89$, $p < .001$, and represented a significantly better fit than the null model, $\chi2(13) = 191.66$, $p < .001$ (see Table 2).

[Please Insert Table 2 Here]

Discussion

To better understand how sport officials' networks and interactions impact their retention, the ego, alter, ego-alter ties, and networks of 116 sports officials were analyzed. In doing so, three important insights were garnered from the results. First, the hierarchical models confirmed that Retention Relationships among officials is a multilevel phenomenon. This was a strong indication that to understand how officials form meaningful relationships leading to retention, characteristics of *both* the individual official (i.e., ego) and those to whom they are connected (i.e., alter) must be considered. This not only supported the need to use multilevel modeling (Perry et al., 2018), but also has been supported in previous referee research. Specifically, that an official's retention is not solely based on the individual's attributes but is greatly impacted by the

community and support networks (Hancock et al., 2022; Kellett & Warner, 2013; Livingston &

Forbes, 2017; Ridinger, Kim et al., 2017). That is, both a referee's individual characteristics *and*

their network (i.e., who and how many people they are connected to) matters.

Second, key findings emerged related to the characteristics of the official's Retention

Relationships or connections that were instrumental to their continuation as an official.

Particularly, relationships that centered on Outside Communication and Community were

important when considering characteristics of an official's network that fostered continuation in

the role. Network size, tenure status, and the level of officiating also were significant when

considering an official's network and its impact on retention. This aligns with Warner's (2016)

Sport and Sense of Community Theory, which posits that community is key to retention within

sport settings. To expound, when examining Retention Relationships, Outside Communication

was significant and positive, meaning that when an individual and their alters communicate with

greater frequency in ways unrelated to officiating, compared to others in their networks, that is

more likely to be a Retention Relationship. That is, when officials engage in more non-work-

related conversations, they form deeper relationships, which positively impact retention. This

finding aligns with Tingle et al. (2022), as many of the officials in that study described the

relationships that helped them process the non-basketball specific concerns they were

experiencing as paramount to their retention. Similarly, another important finding regarding the

characteristics of officials' networks was that the more a connection (i.e., alter) makes an

individual (i.e., ego) feel attached to the larger officiating community, the more likely that tie is a

Retention Relationship. This finding directly supports Kellett and Warner's (2011) research with

Australia Rules Football officials. It also supports Warner and Dixon's (2013) research that

indicated, "genuine concern beyond the athletic field" (p. 263) was fundamental to athletes

experiencing a sense of community and ultimately, retention (Berg & Warner, 2019).

Another interesting result regarding officials' individual ego networks and Retention Relationships is that Tenure was significant and negative. That is, compared to other participants, officials with more tenure rated their average alter as less influential on their decisions to continue officiating. Thus, more veteran officials reported lower retention relationship scores for their alters than did less experienced officials. This finding suggests that for officials with more tenure, their decision to continue officiating is less reliant on those in their network. When examining previous literature, it is perhaps not surprising that sports officials with longer tenure are less likely to report that alter ties are significant in their retention. Previous researchers have indicated that as they advance, officials develop coping mechanisms which allow them to deal with abuse and psychological stressors (Anshel et al., 2014; Devís-Devís, et al., 2021; Folkesson et al., 2002). Additionally, López-Aguilar et al. (2021) found there is a strong relationship between an official's experience level and their self-efficacy. The longer an official is in the profession, the more likely they are to move into leadership or mentor roles, which might also reduce their perceived need for other ties to impact retention. This also points to the idea that less experienced referees likely need to have *more* supportive individuals, and as they progress quantity of relationships is replaced with higher quality relationships.

Network Size also was positive and significant. Officials with larger networks (meaning more alters) reported higher connections on Retention Relationship for the average alter. This finding is unsurprising considering researchers have indicated the importance of comradery (Nordstrom et al., 2016; Phillips & Fairly, 2014), off-court socialization (Warner, Tingle et al., 2013), and refereeing as a means of staying connected to sport and other athletes (Bright et al., 2022; Kim et al., 2022; Zvosec et al., 2021). In fact, Phillips and Fairley (2014) demonstrated how umpiring was a serious leisure pursuit with "strong social opportunities" (p. 194). The sum

of this previous work supports the finding that the larger an official's network is, the more likely they are to be retained.

The final two characteristics that impacted an official's retention networks were the competition level they officiated and if they were in an underrepresented group (i.e., BIPOC). Officials at lower levels of competition were less likely, compared to higher level officials, to find alters to be impactful as a Retention Relationship. Previous researchers have explained that officials at lower levels have less formal infrastructure to provide mentorship (Tingle et al., 2014) and continuing education (Warner, Tingle et al., 2013), both of which negatively impact sense of community (Ridinger, Kim et al., 2017). Additionally, Lopez-Aguilar et al. (2021) found that self-efficacy among amateur referees was impacted by the type and level of the competition, as well as the official's age and experience. At lower levels of competition, the officials were less self-efficacious *and* perceived they had lower levels of organizational support (Livingston & Forbes, 2016), both of which likely reduced the chances they would reach out to mentors.

Along with the officiating level, there also was a significant finding related to racial identification. Specifically, BIPOC officials were more likely to rate connections (i.e., alters) as important for Retention Relationships. While there is a dearth of research on BIPOC officials, we know the sporting environment can be rife with racism, sexism, homophobia, etc. (c.f., Cunningham & Nite, 2020; Steward & Cunningham, 2015) and current officials in the U.S. are primarily White and male (90% and 92% respectively; NASO, 2017). Based on previous studies of female officials (e.g., Nordstrom et al., 2016; Schaeperkoetter, 2017; Tingle et al., 2014, Tingle et al., 2022; Webb et al., 2021), researchers have outlined the importance of female officials having a supportive network to help mitigate the discriminatory environment encountered. It is not surprising, therefore, that BIPOC individuals were more likely to rate alters as important to their retention, as well.

Third, along with highlighting the need to explore officiating retention through a multilevel phenomenon lens and identifying the network characteristics that lead to more officials being retained, this study reiterates that a sense of community is a key factor leading to retention. This confirms Kellett and Warner's (2011) qualitative research findings, and the subsequent officiating research that followed (e.g., Kim et al., 2022; Rindger, 2015; Ridinger, Kim et al., 2017; Tingle et al., 2014; Warner, Tingle et al., 2013). Consequently, this work also lends further support to Warner's (2016) Sport and Sense of Community Theory, which posits that sense of community is "theoretically and empirically linked to retention" and that it "could impact various groups and individuals concerned with participant retention and, subsequently, improve life quality" (p. 195).

Theoretical and Practical Implications

The results also point to two important theoretical and several practical implications. From a theoretical perspective, we should continue to find ways to explore issues from a multi-level perspective (e.g., Cocco et al., 2021; Katz et al. 2019; Katz et al., 2020). In this study, it was vital to explore both the individual and group level characteristics of officiating networks to uncover a more complete picture of the officiating crisis. Also, from a theoretical perspective this work provides strong support for the link between referee social identity (i.e., Jacobs et al., 2020; Zvosec et al., 2021) and sense of community with retention (i.e., Sport and Sense of Community Theory; Warner, 2016). The sport industry can continue to benefit and learn from researchers that explore both individual *and* group phenomenon levels. Through networking analysis, this work captured the individual level (i.e., social identity) *and* the group level (i.e., sense of community) for sports officials in the sample. From a practical perspective, future researchers should continue to examine methodologies that capture individual, group level, and/or environmental characteristics. Specifically, a study could explore the relationship between Social Identity

Theory (i.e., individual level) and Sense of Community (i.e., group/environmental level). While these approaches are conceptual cousins, parsing out the relationship between these two variables would lend further insight into factors that enhance referee retention.

For sport managers, the results indicate the need to create an environment where officials can connect beyond the sport. While formal events (i.e., camps, clinics, evaluation meetings) should be elements of the retention solution (Jacobs et al., 2020; Tingle et al., 2022), the importance of creating informal social opportunities also needs to be emphasized. Researchers continue to highlight this informal space is fundamental to both athletes (Berg & Warner, 2019; Warner, 2019; Warner & Dixon, 2016) and referees (e.g., Jacobs et al., 2020; Kellett & Shilbury, 2007; Kim et al., 2022; Livingston & Forbes, 2016; Phillips & Fairly, 2014; Zvosec et al., 2021) and their retention. Sport managers should note that more tenured officials have smaller support networks and should not assume that because an individual has persisted as an official, they will continue to do so. Finding ways for veteran officials to connect through formalized channels such as serving a mentor, could be one way to expand their support network, give them a sense of purpose, and help develop a stronger sense of community. Another line of research has found that group mentor programs (i.e., combining a matched set of three or four mentor dyads in a mentoring group) could lead to positive outcomes such as enhanced supporting behaviors and increased technical knowledge for both mentor and mentees (Mullen & Klimaiti, 2020). A group mentoring program could lead to a stronger Sense of Community, while also serve to promote Outside Communication, enhance Network Size, and establish meaningful connections for BIPOC and women officials. Future research could explore the connections between formal group mentorship programs, increased sense of community, and retention.

Overall, more effort is needed to increase officials' networks, or the dwindling numbers of officials will continue (Niehoff, 2022). While progress has been made in understanding how

community is built among athletes (Warner & Dixon, 2011, 2013; Warner, Kerwin et al., 2013) and fans (Cianfrone & Warner, 2018; Katz et al., 2019), many of the same lessons can be translated to officials to ensure they are experiencing a stronger sense of community, and thereby retained in the role.

Future Direction and Limitations

All research requires scholars to make methodological choices impacting the findings and generalizability of the data. This study is not without limitations. As a result of using a voluntary response sample, members of the target population did not have an equal probability of participation (Cheung et al., 2017). As with previous research which utilized egocentric network analysis (Katz et al. 2019; Katz et al., 2020) this study employed the sampling procedure because it was not possible to gain access to an entire target population of sports officials in the United States (Cocco et al., 2021). This methodological choice therefore, may have resulted in over- or under-representation of certain referee segments, which limits the generalizability of the results to the entire population. Another possibility is skewed response rates from participants who have strong opinions about sense of community and the importance of social networks in their role as sports officials. Though previous studies indicated that for non-controversial topics, these risks are minimized (Dillman et al., 2014).

Other limitations include the age of participants and timing of sampling. Referees under the age of 18 were not included, and future researchers are encouraged to capture data from this population. As Bright et al. (2022) noted, referees serve an important role in athlete development and athletes may be especially primed for the officiating role. Learning more from referees under the age of 18 could provide key insight. Given that data were collected at the beginning of the season for some officials or near the end of the season for others, the call may have been missed based on factors related to starting a new season (i.e., focused on new rules, new procedures) or

concluding a season (e.g., shifting attention and focus to non-officiating activities). Given the timing, recency bias could have affected responses. Additionally, the call for participants also went out via social media platforms and directly through officiating organizations and was broad, which might have led to certain segments of the officiating population being underrepresented (e.g., BIPOC, LGBTQ+, Women). Future researchers should address these limitations; doing so would help develop a better understanding of specific referee segments and add to the growing use of egocentric network analysis as an important tool in sport management research. Employing Egocentric Network Analysis using a longitudinal approach could be a place to start. These findings seem to indicate that the relationship between sense of community and retention relationships can be affected by officiating tenure and change over time. Collecting data during multiple points in a season or during an official's tenure could yield meaningful insights into how the connections to and meaning of these networks evolve over time. It also should be noted that data were collected soon after the sports world returned to play from the COVID-19 pandemic. This was arguably a time when the importance of sport, and the social support and sense of community it can provide, was heightened (c.f., Warner & Martin, 2020).

Future researchers also could explore historically marginalized populations more intentionally. The scant research on women sports officials, for example, indicates that they may experience the need for community and deep networks in different ways than their male counterparts. To date, there are no studies which have specifically and intentionally explored how LGBTQ+ or BIPOC sports officials experience a sense of community and how their networks lead to retention behaviors. The initial findings of this study signal there may indeed be meaningful differences that warrant exploration. A broader analysis of sports officials' segments could identify potential similarities and differences among them. Researchers also could explore officials with longer tenures and compare those to officials in their first or second years of

experience. Lastly, scholars should consider exploring cross-cultural differences. For example, the ways in which officials in Europe, Australia, Asia, or the Global South utilize networks to develop and experience a sense of community might differ from those in the United States.

This study represents an important first step in confirming, through hierarchical models, that officials' Retention Relationships are a multilevel phenomenon. Thus, to understand how officials form meaningful relationships that lead to retention, future research must continue to consider the characteristics of *both* the individual (i.e., ego) and those to whom they are connected (i.e., alters). Accordingly, we see an opportunity for researchers and practitioners to collaborate on research which explores issues surrounding referee retention. We hope our research inspires future scholarship in this area, but also encourages future collaboration between scholars and practitioners to design new retention programs and track their progress. Per our results, a good place to start would be a pilot program which encourages outside communication among BIPOC officials. Opportunities to track the time spent on and effectiveness of non-officiating related conversations and testing whether Outside Communication has a positive effect on Retention Relationship, as found in this study, would be an important longitudinal study. Other ways for scholars and practitioners to collaborate include: developing traditional or group-based mentorship programs, creating structured social support/networking opportunities before or after professional development sessions, and encouraging officials to use technologies (e.g. Zoom) to enhance sense of community with those outside their immediate geographic region. In all of those examples, scholars could help design the programs in ways to explore differences between the tenure of officials, with the aim of collecting data to analyze the program's impact on retention.

Conclusion

Sports officials are essential to organized sport and their tasks are challenging and demanding. While the role of a sports official always has been difficult, from youth levels to the professional leagues, sport participation is becoming ever more competitive and players, coaches, fans, and consumers seem to have increased expectations of referees' performances (Dawson et al., 2022; Devis-Devis et al., 2021; Kellett & Warner, 2011; Livingston & Forbes, 2017; Nordstrom et al., 2016; Tingle et al., 2014; Webb, 2018). As a result of these persistent challenges, officials are dropping out in high numbers (Jacobs et al., 2020; Niehoff, 2022). Yet many officials do persist and enjoy long, sustained careers. For those who have been retained, the size of their network and their ability to connect beyond the officiating sphere were integral to retention. Additionally, officials at lower competitive levels and those with more tenure were less likely to report those in their network as significant retention relationships. Conversely, BIPOC officials were more likely to rate their network connections as more important to their retention decisions than non-BIPOC officials. These insights suggest that there is nuance to the development and support garnered from a sports official's support network. Continued examination of officials' social support and the sense of community experienced in these networks is a key to developing a more holistic picture of why some officials are motivated to continue in the role (Giel & Breuer, 2020; Hancock et al., 2022; Ridinger, Warner et al., 2017; Zvosec et al., 2021).

While previous research points to the importance of community (Kellet & Warner, 2011; Ridinger, Kim, et al., 2017; Tingle et al., 2014; Warner, Kerwin et al., 2013; Warner, Tingle et al., 2013) this study used egocentric network analysis as a first step to understanding how referees engage their social networks to develop a sense of community. Specifically, the findings create a more holistic picture, for future scholars and practitioners about how ego, alter, ego-alter tie, and network characteristics affect retention of sports officials. As sport management scholars

continue exploring issues associated with sports official's abuse, psychological stressors,

motivations, and retention these results provide a path for future researchers to include network

analysis as a means to better understand how a sense of community develops from a multilevel

perspective and how those networks relate to persistence and retention.

References

Anderson, A. & Warner, S. (2017). Social network analysis as a complimentary tool to

measuring team cohesion. *Journal of Sport Behavior, 40, 3-24.*

Anshel, M. H., Kang, M., & Jubenville, C. (2013). Sources of acute sport stress scale for sports

officials: Rasch calibration. *Psychology of Sport and Exercise*, *14*, 362-370.

https://doi.org/10.1016/j.psychsport.2012.12.003

Anshel, M. H., Sutarso, T., Ekmekci, R., & Saraswati, I. W. (2014). A model linking sources of

stress to approach and avoidance coping styles of Turkish basketball referees. *Journal of

Sports Sciences, 32*, 116-128. https://doi.org/10.1080/02640414.2013.816762

Anshel, M. H., & Weinberg, R. S. (1995). Sources of acute stress in American and Australian

basketball referees. *Journal of Applied Sport Psychology*, *7*, 11-22.

https://doi.org/10.1080/10413209508406297

Ashmore, R. D., Deaux, K., McLaughlin-Volpe, T. (2004). An organizing framework for

collective identity: articulation and significance of multidimensionality. *Psychological

Bulletin. 130,* 80-114. https://doi.org/10.1037/0033-2909.130.1.80

Berg, B. & Warner, S**.** (2019). Advancing college athlete development via social support.

Journal of Issues in Intercollegiate Athletics, 12, 87-113.

Borgatti, S. P. (2006). *E-NET software for the analysis of ego-network data*. Analytic

Technologies.

Borgatti, S. P., & Halgin, D. (2011). On network theory. *Organization Science, 22*, 1168–1181.

https://doi.org/10.1287/orsc.1100.0641

Borgatti, S. P., Everett, M. G., Johnson, J. C., & Agneessens, F. (2022). *Analyzing Social

Networks Using R*. Sage.

Borgatti, S. P., Everett, M. G., Johnson, J. C., & Agneessens, F. (2022). *Analyzing social networks using R*. Sage.

Bright, V., Warner, S., & Zvosec, C. (2022). Refereeing as a post-athletic career option. *Journal of Sport Management 36*(6), 548-558. https://doi.org/10.1123/jsm.2021-0268

Burt, R. S., 1992. *Structural holes*. Harvard University Press.

Cheung, K.L., ten Klooster, P.M., Smit, C., de Vries, H., & Pieterse, M. E. (2017). The impact of non-response bias due to sampling in public health studies: A comparison of voluntary versus mandatory recruitment in a Dutch national survey on adolescent health. *BMC Public Health 17,* 276-285. https://doi.org/10.1186/s12889-017-4189-8

Cianfrone, B., & Warner, S. (2018). Developing sport communities via social media: A conceptual framework. *International Journal of Sport Management, 19*, 44-56.

Cocco, A. R., Katz, M., & Hambrick, M. E. (2021). Co-attendance communities: A multilevel egocentric network analysis of American soccer supports' groups. *International Journal of Environment Research & Public Health, 18*, 1-18. https://doi.org/10.3390/ijerph18147351

Crossley, N., Bellotti, E., Edwards, G., Everett, M. G., Koskinen, J., & Tranmer, M. (2015). *Social network analysis for ego-nets*. Sage.

Cunningham, G. B., & Nite, C. (2020). LGBT diversity and inclusion, community characteristics, and success. *Journal of Sport Management, 34*, 533-541. https://doi.org/10.1123/jsm.2019-0338

Cunningham, I., Simmons, P., & Mascarenhas, D. (2018). Sport officials' strategies for managing interactions with players: Face-work on the front-stage. *Psychology of Sport and Exercise, 39*, 154-162. https://doi.org/10.1016/j.psychsport.2018.08.009

Dawson, P., Webb, T., & Downward, P. (2022). Abuse is not a zero-sum game! The case for zero

    tolerance of match official physical and verbal abuse. *European Journal of Sport Science,*

    22, 417-424. https://doi.org/10.1080/17461391.2021.1881619

Devís-Devís, J., Serrano-Durá, J., & Molina, P. (2021). "The referee plays to be insulted!": An

    exploratory qualitative study on the Spanish football referees' experiences of aggression,

    violence, and coping. *Frontiers in Psychology, 12,* 1-12.

    https://doi.org/10.3389/fpsyg.2021.656437

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode*

    surveys: The tailored design method (4th ed.). John Wiley & Sons, Inc.

Folkesson, P., Nyberg, C., Archer, T., & Norlander, T. (2002). Soccer referees' experience of

    threat and aggression: Effects of age, experience, and life orientation on outcome of

    coping strategy. *Aggressive Behavior, 28*, 317-327. https://doi.org/10.1002/ab.90028

Forbes, S. L., & Livingston, L. A. (2013). Changing the call: Rethinking attrition and retention in

    the ice hockey officiating ranks. *Sport in Society: Cultures, Commerce, Media, Politics,*

    16, 295–309. https://doi.org/10.1080/17430437.2013.779854

Fowler, B., Smith, J., Nordstrom, H., & Ferguson, T. (2019). Ice hockey officiating retention: A

    qualitative understanding of junior ice hockey officials' motivations in Canada.

    Managing Sport and Leisure, 24, 18-31. https://doi.org/10.1080/23750472.2019.1565944

Gorczynski, P., & Webb, T. (2021). Developing a mental health research agenda for football

    referees, *Soccer & Society, 22*, 655-662. https://doi.org/10.1080/14660970.2021.1952695

Giel, T., & Breuer, C. (2020). The determinants of the intention to continue voluntary football

    refereeing. *Sport Management Review, 23*, 242-255.

    https://doi.org/10.1016/j.smr.2019.01.005

Halgin, D. S., & Borgatti, S. P. (2012). An introduction to personal network analysis and tie

churn statistics using E-NET. *Connections, 32*, 37–48.

Hancock, D. J., Dawson, D. J., & Auger, D. (2015). Why ref? Understanding sport officials'

motivations to begin, continue, and quit. *Movement & Sport Sciences, 87*, 31-39.

https://doi.org/10.1051/sm/2014018

Hancock, D. J., Paradis, K. F., Martin, L. J., & Evans, M. B. (2022). Investigating perceptions of

cohesion, performance, and satisfaction in sport officiating groups, *Managing Sport and*

Leisure, advanced online. https://doi.org.10.1080/23750472.2022.2092536

Jacobs, B. L., Tingle, J. K., Oja, B. D., & Smith, M. A. (2020). Exploring referee abuse through

the lens of the collegiate rugby coach. *Sport Management Review*, *23*, 39-51.

https://doi.org/10.1016/j.smr.2019.03.004

Katz, M., Heere, B., & Melton, E. N. (2019). Predicting fan behavior through egocentric network

analysis: Examining season-ticket holder renewal. *Journal of Sport Management*, *34*,

217-228. https://doi.org/10.1123/jsm.2019-0018

Katz, M., Mansfield, A. C., & Tyler, B. D. (2020). The strength of fan ties: Emotional support in

sport fan egocentric networks. *Journal of Sport Management, 34*, 291-302.

https://doi.org/10.1123/jsm.2019-0170

Kellett, P., & Warner, S. (2011). Creating communities that lead to retention: the social worlds

and communities of umpires. *European Sport Management Quarterly, 11*, 471-494.

https://doi.org/10.1080/16184742.2011.624109

Kellett, P. & Shilbury, D. (2007). Umpire participation: Is abuse really the issue? *Sport*

Management Review, 10, 209-229. https://doi.org/10.1016/S1441-3523(07)70012-8

Kim, M., Kim, H. S., Simmond, A., & Warner, S. (2022) Strengthening referees' psychological

    well-being through engagement and authenticity, *Sport Management Review, 25,* 254-

    274. https://doi.org/10.1080/14413523.2021.1930952

Livingston, L. A., & Forbes, S. L. (2016). Factors contributing to the retention of Canadian

    amateur sport officials: Motivations, perceived organizational support, and resilience.

    International Journal of Sports Science and Coaching, 11, 342-355.

    https://doi.org/10.1177/1747954116644061

Livingston, L. A., & Forbes, S. L. (2017). Resilience, motivations for participation, and

    perceived organizational support amoungst aesthetic sports officials. *Journal of Sport

    Behavior, 40*, 43-67.

Livingston, L., Forbes, S. L., Wattie, N., & Cunningham, I. (2020). *Sport officiating:

    Recruitment, development, and retention*. Routledge.

López-Aguilar J., Castillo-Rodriguez A., Chinchilla-Minguet, J. L., & Onetti-Onetti, W. (2021).

    Relationship between age, category and experience with the soccer referee's self-efficacy.

    PeerJ, 9, e11472. https://doi.org/10.7717/peerj.11472

Maas, C. J., & Hox, J. J. (2005). Sufficient sample sizes for multilevel modeling. *Methodology,

    1,* 86-92. https://doi.org/10.1027/1614-2241.1.3.86

Masteralexis, L. P., Barr, C., & Hums, M. A. (2012). *Principles and practices of sport

    management*. Jones & Bartlett Learning: Sudbury, MA.

Matsuyama, Y. (2013). Hierarchical linear modeling. In M.D. Gellman & J.R. Turner (Eds.)

    Encyclopedia of Behavioral Medicine. Springer, New York. https://doi.org/10.1007/978-

    1-4419-1005-9_407

McCarty, C., Lubbers, M. J., Vacca, R., & Molina, J. L. (2019). *Conducting personal network

    research: A practical guide*. Guilford Publications.

Mullen, C. A., & Klimaitis, C. C. (2021). Defining mentoring: A literature review of issues, types, and applications. *Annals of the New York Academy of Sciences, SI: Mentoring*, 19-35. https://doi.org/10.1111/nyas.14176

NASO. (2017). *National officiating survey*. National Association of Sports Officials. Retrieved online May 10, 2022 from https://www.naso.org/survey/.

Niehoff, K. (2022, February 16). With loss of 50,000 officials, NFHS organizes consortium to find solutions. Retrieved on April 20, 2022 from https://www.nfhs.org/articles/with-loss-of-50-000-officials-nfhs-organizes-consortium-to-find-solutions/.

Nordstrom, H., Warner, S., & Barnes, J. (2016). Behind the stripes: Female football officials' experiences. *International Journal of Sport Management and Marketing, 16*, 259-279. https://doi.org/10.1504/IJSMM.2016.077934

Oja, B. D., Bass, J. R., & Gordon, B. S. (2020). Identities in the sport workplace: Development of an instrument to measure sport employee identification. *Journal of Global Sport Management, 5*, 262–284. https://doi.org/10.1080/24704067.2018.1477521

Pack, S. M., Jordan, J. S., Turner, B. A., & Haines, D. (2007). Perceived organizational support and employee satisfaction and retention. *Recreational Sports Journal, 31*, 95-106. https://doi.org/10.1123/rsj.31.2.95

Perry, B. L., Pescosolido, B. A., & Borgatti, S. P. (2018). *Egocentric network analysis*. Cambridge University Press.

Phillips, P., & Fairley, S. (2014). Umpiring: A serious leisure choice. *Journal of Leisure Research, 46*, 184-202. https://doi.org/10.1080/00222216.2014.11950319

Rabe-Hesketh, S., & Skrondal, A. (2012, April). Understanding variability in multilevel models for categorical responses. In *AERA Annual Meeting, Vancouver, Canada*.

Rainey D. W., & Hardy. L. (1997). Ratings of stress by rugby referees. *Perceptual and Motor Skills, 84*, 728-730. https://doi.org/10.2466/pms.1997.84.3.728

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (Vol. 1). Sage.

Raudenbush, S. W., Bryk, A. S., & Congdon, R. (2011). HLM 7 for Windows. [Computer software]. Scientific Software International, Inc.

Ridinger, L. (2015). Contributors and constraints to involvement with youth sports officiating. *Journal of Amateur Sport, 1*, 103-127. https://doi.org/10.17161/jas.v1i2.4946

Ridinger, L. L., Kim, K. R., Warner, S., & Tingle, J. K. (2017). Development of the referee retention scale. *Journal of Sport Management, 31*, 514-527. https://doi.org/10.1123/jsm.2017-0065

Ridinger, L. L., Warner, S., Tingle, J. K., & Kim, K. R. (2017). Why referees stay in the game. *Global Sport Business Journal, 5*(3), 22-37.

Schaeperkoetter, C. C. (2017). Basketball officiating as a gendered arena: An autoethnography. *Sport Management Review, 20*, 128-141. https://doi.org/10.1016/j.smr.2016.05.001

Scheepers, D., & Ellemers, N. (2019) Social identity theory. In Sassenberg K., & Vliek M. (Eds.), *Social psychology in action (*pp. 129-143). Springer. https://doi.org/10.1007/978-3-030-13788-5_9

Smith, K. P., & Christakis, N. A. (2008). Social networks and health. *Annual Review of Sociology*, *34*(1), 405-429. https://doi.org/10.1146/annurev.soc.34.040507.134601

Song, L., Son, J., & Lin, N. (2011). Social support. In J. Scott & P.J. Carrington (Eds.), *The SAGE handbook of social network analyses* (pp. 116–128). Sage.

Steward, A. D., & Cunningham, G. B. (2015). Racial identity and its impact on job applicants. *Journal of Sport Management, 29*, 245-256. https://doi.org/10.1123/jsm.2014-0017

Tajfel, H. E. (1978). *Differentiation between social groups: Studies in the social psychology of intergroup relations*. Academic Press.

Tingle, J., Warner, S., & Sartore-Baldwin, M. (2014). The experience of former women referees and the community level impact. *Sex Roles, 71*, 7-20. https://doi.org/10.1007/s11199-014-0366-8

Tingle, J. K., Jacobs, B. L., Ridinger, L. L., & Warner, S. (2022). Female sports officials and mental health: The overlooked problem. *Journal of Sport Management, 36*, 383-393. https://doi.org/10.1123/jsm.2020-0443

Warner, S. (2019). Sport as medicine: How F3 is building healthier men and communities. *Sport Management Review, 28,* 38-52. https://doi.org/10.1016/j.smr.2018.06.006

Warner, S. (2016). Sport and sense of community theory. In Cunningham, G. B., Fink, J., & Doherty, A. (Eds.), *Routledge handbook of theory in sport management* (pp. 189-198). Routledge.

Warner, S., & Dixon, M. A. (2011). Understanding sense of community from an athlete's perspective. *Journal of Sport Management, 25*, 258-272. https://doi.org/10.1123/jsm.25.3.257

Warner, S., & Dixon, M. A. (2013). Sport and community on campus: Constructing a sport experience that matters. *Journal of College Student Development, 54*, 283-298. https://doi.org/10.1353/csd.2013.0044

Warner, S., & Dixon, M. A. (2016). Connecting it all: Creating community in sport and entertainment. *Sport & Entertainment Review, 2*, 45-50.

Warner, S., Bowers, M., & Dixon, M. A. (2012). Team Dynamics: A social networking perspective. *Journal of Sport Management, 26,* 53 - 66. https://doi.org/10.1123/jsm.26.1.53

Warner, S., Kerwin, S., & Walker, M. (2013). Examining sense of community in sport: Developing the multidimensional 'SCS' Scale. *Journal of Sport Management, 27,* 349-362. https://doi.org/10.1123/jsm.27.5.349

Warner, S., & Martin, T. R. (2020). COVID-19 and sport: What are we really missing? *Sport & Entertainment Review.* 6(2). https://serjournal.com/2020/07/03/white-paper-covid-19-and-sport-what-are-we-really-missing/

Warner, S., Tingle, J. K., & Kellett, P. (2013). Officiating attrition: Considering the experiences of referees from a sport development perspective. *Journal of Sport Management, 27*, 316-328. https://doi.org/10.1123/jsm.27.4.316

Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications.* Cambridge University Press. https://doi.org/10.1017/CBO9780511815478

Wayne, S. J., Shore, L. M., Bommer, W. H., & Tetrick, L. E. (2002). The role of fair treatment and rewards in perceptions of organizational support and leader-member exchange. *Journal of Applied Psychology, 87*, 590–598. https://doi.org/10.1037/0021-9010.87.3.590

Webb, T. (2018). Referees and the media: A difficult relationship but an unavoidable necessity. *Soccer and Society, 19*, 205-221. https://doi.org/10.1080/14660970.2015.1133414

Webb, T., M. Dicks, R. Thelwell, J. van der Kamp, & G. Rix Lievre. (2020). An analysis of soccer referee experiences in France and the Netherlands: Abuse, conflict, and level of support. *Sport Management Review 23*, 52–65. https://doi.org/10.1016/j.smr.2019.03.003

Webb, T., Gorczynski, P., Oftadeh-Moghadam, S., & Grubb, L. (2021). Experience and construction of mental health among English female football match officials. *The Sport Psychologist, 35*, 1-10. https://doi.org/10.1123/tsp.2020-0086

Wellman, B., & Wortley, S. (1990). Different strokes from different folks: Community ties and

social support. *American Journal of Sociology, 96*, 558-588.

https://doi.org/10.1086/229572

Woltman, H., Feldstain, A., Mackay, J. C., & Rocchi, M. (2012) An introduction to hierarchical

linear modeling, *Tutorials in Quantitative Methods for Psychology, 8*(1), 52-69.

https://doi.org/10.20982/tqmp.08.1.p052

Zvosec, C. C., Oja, B. D., & Baer, N. (2021). 'Team zebra': An exploration of social identity,

motivation, and sport officiating persistence. *Journal of Global Sport Management*.

https://doiorg/10.1080/24704067.2021.1899766