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**Exploring Perceptions of Group Processes in Ice Hockey Officiating**

Submitted to: *Journal of Applied Sport Psychology*

Submitted: December 1, 2016

Resubmitted: April 10, 2017

Main Body Word Count: 6976

1 **Abstract**

2 Understanding factors that influence sport officials' performance is vital to ensuring fair sport  
3 competition. Through semi-structured interviews ( $N = 17$ ), we explored officials' perceptions of  
4 group processes that occurred among ice hockey officiating teams. Participant responses  
5 revealed numerous ways that group processes were present within officials' interactions, and two  
6 unique characteristics involved the transient nature of officiating groups (frequently performing  
7 with different officials) and intra-team competition pertaining to post-season assignments. In the  
8 discussion, we expand on the unique nature of officiating groups, synthesize activities in which  
9 officials seek to enhance groupness, and provide insights for future interventions and researchers.

10

11 *Keywords:* group dynamics, sport officials, intra-team competition, performance psychology

## Exploring Perceptions of Group Processes in Ice Hockey Officiating

Peak athletic performance requires perceptual-cognitive skills (e.g., anticipation; Müller & Abernethy, 2012), social support (e.g., elite coaching; Bloom, Crumpton, & Anderson, 1999), and talent development (e.g., sampling sport; Côté, 1999). While less frequently studied, referees, assistant referees, umpires, and linesmen/lineswomen (collectively termed *officials* herein) represent central sport figures, and understanding their peak performance is equally important. Officials' tasks are complicated, as they attempt to make rapid, accurate decisions that influence competitive outcomes. Soccer officials, for instance, make up to 200 observable decisions per match (Helsen & Bultynck, 2004). Though officials have been researched to understand athletic performance, it is beneficial to study officials for the sake of optimizing officials' performances (Rix-Lièvre, Hancock, & Côté, 2014). The first step in such an endeavor is to identify criteria that facilitate successful performance, enabling officials to learn and apply those criteria. Mascarenhas, Collins, and Mortimer (2005) proposed five skills required for officials' success: (1) fitness/positioning; (2) knowledge/application of the law; (3) game management; (4) contextual judgment; and (5) psychological features. Certainly, these skills outline requisite criteria for peak individual performance. Overlooked by Mascarenhas and colleagues, however, are the complexities of teamwork. In ice hockey, up to four officials (i.e., two referees and two linesmen) work collectively during competition. Therein, officials possibly engage in interdependent actions where one official's performance influences, and is influenced by, in-game partners. Understanding the critical role of group dynamics in these interactions, therefore, is paramount to understanding officials' performance.

Group dynamics describes "the nature of groups, the laws of their development, and their interrelations with individuals, other groups, and larger institutions" (Cartwright & Zander, 1968,

1 p. 19). Individual and group factors influence how groups function, as do cognitions and  
2 behaviors of individuals in the group. One official rarely adjudicates a competition, and group  
3 processes are likely present. For example, officials make collective decisions, plan movements,  
4 and communicate—described as effective coordination (i.e., members act in complementary  
5 ways to succeed; Eccles & Tenenbaum, 2004). Interactions in and around competitions might  
6 represent group-based teamwork, including maintaining positive interactions among members, or  
7 preparing, executing, and evaluating group performances (McEwan & Beauchamp, 2014).

8         Social psychology theories might explain how group processes satisfy desires for group  
9 membership and influence individual experiences. Researchers suggest humans have an innate  
10 need for inclusion (Baumeister & Leary, 1995; Brewer & Caporael, 2006), and although officials  
11 perform individual tasks, an innate need to belong is likely present and should be considered.  
12 Additionally, officials typically belong to larger organizations (e.g., officials' associations) that  
13 provide structure and guidance for members. Such organizations might constitute a core element  
14 of officials' social identities (e.g., Tajfel & Turner, 1985). Since group identity influences a  
15 range of outcomes from efficacy (e.g., Rubin & Hewstone, 1998) to adherence behaviors (e.g.,  
16 Spears, Doosje, & Ellemers, 1999), understanding the specific groups to which officials identify  
17 is important. Whereas officials belong to larger organizations, competitions are officiated in  
18 smaller groups, highlighting that task-specific performance subgroups exist. Thus, the contexts  
19 of group membership are important considerations when investigating officials.

20         Applying the aforementioned group processes to enhance officials' interactions and  
21 performance depends on whether officials represent legitimate groups. This is significant, as not  
22 all collections of individuals conceptually and practically represent groups (Carron & Eys, 2012).  
23 Carron and Eys (2012) consolidated five characteristics that must be satisfied for group

1 classification: (1) members must see themselves as a group (*self-categorization*; Tajfel & Turner,  
2 1985), (2) members likely influence one another (*common fate*; e.g., Fiedler, 1967), (3) the  
3 group's existence is rewarding to individual members (*mutual benefit*; e.g., Bass, 1960), (4) the  
4 group experiences emergent roles, norms, and leadership (*social structure*; Newcomb, 1951),  
5 and (5) members interact frequently (*quality interactions*; Shaw, 1981). Despite belonging to a  
6 larger organization, officials commonly perform with partners they have rarely, or never, met.  
7 This calls into question whether officials meet the five characteristics for group classification.

8         Considering whether a collection is a group—and by extension, experiences group  
9 processes—is conceptualized as entitativity (i.e., the degree to which a collection of individuals  
10 is an entity; Campbell, 1958). The degree of entitativity (also termed *groupness*) could result  
11 from the group's physical properties, or individual perceptions of group members (Hamilton,  
12 2007). Recent findings indicate that athletes who perceive increased groupness also experience  
13 greater commitment, intentions to return, and identity perceptions (e.g., Martin, Balderson,  
14 Hawkins, Wilson, & Bruner, 2017; Spink, Ulvick, McLaren, Crozier, & Fesser, 2015).

15 Considering their unique nature, obtaining a clear understanding of how group processes apply to  
16 officials is critical, especially since group processes are more potent in true group environments,  
17 compared to mere affiliations (e.g., Estabrooks, Harden, Johnson, & Pardo, 2014). Therefore, it  
18 was important herein to investigate group processes among officials, exploring the extent to  
19 which officials believed group processes to be evident in their interactions. Such knowledge is  
20 imperative to optimizing group performance and officials' personal experiences, achieved  
21 through interventions, policies, or broader organizational practices.

22         Beyond exploring officials' group processes, the present study serves as a foundation for  
23 research oriented toward improving officials' performance, retention, and social experiences.

1 Group cohesion elevates athletic performance (Carron, Colman, Wheeler, & Stevens, 2002), and  
2 possibly, the same is true of officials. This is relevant, as officials' performances typically  
3 require teamwork to execute tasks. Secondly, officials' performance requires a complex skill set  
4 necessitating talent development, which is undermined by high attrition (VanYperen, 1998).  
5 Consequently, the officials' talent pool is prematurely minimized, leading to advancement based  
6 on necessity rather than competence (Auger, Fortier, Thibault, Magny, & Gravelle, 2010).  
7 Suggestions for reducing officials' attrition include enhancing positive affect (VanYperen, 1998)  
8 and facilitating social connections (Hancock, Dawson, & Auger, 2015), both of which are  
9 influenced by group processes. Thus, our purpose was to study the nature of group processes  
10 and group characteristics among ice hockey officials. Considering this research was initiated on  
11 an assumption that groups influence many aspects of officials' experiences (e.g., on-ice  
12 performance; social interactions) we specifically sought to: (1) explore the group processes and  
13 characteristics revealed within these groups, and (2) study how group processes shape officials'  
14 personal experiences and performances. In doing so, we believed we could identify whether  
15 officials constitute groups, making inferences for improving officials' performances.

## 16 **Method**

### 17 **Qualitative orientation and methodology**

18 The lead author is an experienced ice hockey official (he officiated in the Canadian  
19 Junior Hockey League), and his belief that group processes were relevant for officials prompted  
20 the research. Interviews were designed to reveal rich stories about group experiences, though we  
21 adopted the stance that the social processes evident in those personal experiences could be  
22 probed using research pertaining to group dynamics in sport as an interpretive lens. Underlying  
23 this assumption, a critical realist ontological orientation, guided the research (Maxwell, 2012).

1 The orientation entails a realist ontology—in this case, we presumed that group concepts like  
2 status, performance, or cohesion are natural group processes that emerge among officials and  
3 represent an underlying reality. Nevertheless, this orientation also acknowledges  
4 epistemological relativism, wherein any understanding about groups is inherently subject to  
5 interpretation and is shaped by individuals' unique positions (i.e., referees vs. linesmen).  
6 Accordingly, while we assumed many group processes represented a social reality, we valued  
7 unique individual experiences and considered the roles of the interviewers and participants when  
8 interpreting the experiences discussed during interviews.

9 In line with this orientation, we utilized a generic descriptive methodological approach  
10 (i.e., Caelli, Ray, & Mill, 2003; Sandelowski, 2000) by adopting common tools from dominant  
11 qualitative perspectives. As opposed to aligning with an established methodology, our  
12 descriptive methodology applied to data collection, sampling (e.g., purposeful sampling and  
13 semi-structured interviews: Patton, 2002; Polkinghorne, 2005), and thematic analysis (Braun,  
14 Clarke, & Weate, 2016). Importantly, we adopted tools from specific methodologies when  
15 necessary (e.g., collaboration during analysis; Hill, Thompson, & Williams, 1997).

## 16 **Participants**

17 We used purposive sampling, identifying participant criteria that enabled rich, descriptive  
18 interviews (Patton, 2002). We sought elite amateur ice hockey officials with at least two years'  
19 experience in the Canadian Hockey League<sup>1</sup> or the Canadian Junior Hockey League<sup>2</sup>. In these  
20 leagues, officials perform in four-person teams, with two referees (i.e., responsible for awarding

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<sup>1</sup> The Canadian Hockey League (athletes 16-20 years) is a national amateur ice hockey league, which includes a small percentage of international players. It is considered the most elite amateur ice hockey league in the world, producing 40-50% of the draftees for the National Hockey League (<http://www.nhl.com/ice/page.htm?id=31877#2>).

<sup>2</sup> The Canadian Junior Hockey League (athletes 15-20 years) is a national amateur ice hockey league, one tier below the Canadian Hockey League. Players often attain collegiate scholarships, with a small percentage being drafted to the National Hockey League. We recruited from one branch of this league, the Central Canada Hockey League.

1 goals and assessing penalties) and two linesmen (i.e., responsible for monitoring off-sides and  
2 icings). We sampled participants until saturation was reached (i.e., iteratively analyzing data to  
3 identify when few novel concepts were revealed), yielding 17 male officials ( $M_{age} = 30.53$  years,  
4  $SD = 5.62$ , range = 22-40;  $M_{experience} = 13.0$  years,  $SD = 7.17$ ). This represented 10 referees  
5 (coded R1 to R10) and seven linesmen (coded L1 to L7). Ten officials were employed in the  
6 Canadian Junior Hockey League; seven worked the Canadian Hockey League.

### 7 **Procedure**

8         We obtained institutional research ethics board approval before recruitment, and  
9 participants provided written consent prior to the interviews. The Referee-in-Chief for each  
10 league was contacted via email, wherein the authors explained the project purpose and data  
11 collection process. The Referee-in-Chiefs were asked to forward the email to all association  
12 members, asking interested officials to email the research team regarding participation.

13         The first ( $n = 14$ ) and second ( $n = 3$ ) authors conducted face-to-face semi-structured  
14 interviews. Both interviewers engaged in online journaling after each interview, describing main  
15 themes discussed by the participants, as well as researchers' insights. Every three to five  
16 interviews, the interviewers spoke on the phone to share insights and reflections. The interviews  
17 were conducted in mutually convenient public spaces over two summer months (participants'  
18 off-season). Interviews averaged 40m51s (range: 30 to 50 minutes; transcribed verbatim totaling  
19 122,386 words). Following initial analysis, officials were emailed their coded transcripts and a  
20 summary of results. We encouraged participants to provide feedback or to identify discrepancies  
21 between their intended meanings and our interpretations; however, no participants replied.

### 22 **Interview Guide**



1 Interviews were guided by open-ended questions (see Appendix A) and probing  
2 questions when necessary. Interviews began with initial questions to establish rapport (Patton,  
3 2002) and develop a shared sense of each participant's pathway through officiating. We  
4 encouraged participants to describe the nature of their interactions with other officials, contrast  
5 their positive and negative experiences, and reflect on how the groups to which they belonged  
6 affected their experiences. Core questions included, "Can you discuss some of the things that  
7 might lead you to consider yourself to be part of a group or not?" and "Can you provide  
8 examples to demonstrate how feeling close to your fellow officials enhances or hinders your  
9 performance?" Actual interview processes shifted over time, and emerging concepts were  
10 probed in later interviews. For example, it emerged that group processes existed for on-ice  
11 performance (i.e., task-specific context), peer relationships (i.e., social context), and officials'  
12 organizations (i.e., organizational context). Interviewers probed each potential context.

### 13 **Analysis and Validity**

14 Interviewers completed post-interview reflective journals, which were shared with the  
15 research team through an online document. Entries detailed the core concepts participants  
16 discussed, researcher observations, and emerging concepts. The goal of journaling was to  
17 maintain sensitivity to the ways that the researchers' prior experiences and the research process  
18 shaped interviews (Mays & Pope, 2000). This helped challenge assumptions and allow all team  
19 members to take on the role of critical friends, while ensuring interviewers could use shared  
20 knowledge to advance toward later interviews (Bradbury-Jones, 2007; Hill et al., 1997). This  
21 process laid a foundation for thematic analysis, where the objective was to move beyond  
22 descriptions of group experiences, and advance toward an understanding of officials' group  
23 dynamics both in and out of competitions (e.g., Braun et al., 2016; Patton, 2002). Phase one of

1 analysis was open coding, which was conducted by the third author. After reading transcripts  
2 and interviewer journals, the third author reviewed the interviews on a line-by-line basis to  
3 identify descriptive content (e.g., participants' experience) and analytical codes (e.g., feeling  
4 powerless as new officials); emergent concepts were labelled using NVivo®. This process  
5 revealed 82 unique open codes, primarily grouped by the third author into 18 categories.

6       Regarding the phase of developing, refining, and naming themes, the research team  
7 independently reviewed the coded interviews before hosting a conference call to discuss how to  
8 represent the data using core themes. As a result, 14 of the 18 categories were collapsed within  
9 one of the five defining characteristics of groups (Carron & Eys, 2012), while four categories  
10 were retained within two themes that depicted the unique forms of transience and competition  
11 that underpin officials' groups. The first author then returned to the interviews and notes to  
12 interpret the data using this framework, identifying representative quotes and experiences that  
13 supported descriptions of each theme. As Carron and Eys' (2012) framework was applied to  
14 represent the data *after* initial coding, this thematic analysis was neither inherently inductive nor  
15 deductive. Rather, it represents abductive reasoning (Ryba, Haapanen, Mosek, & Ng, 2012) as it  
16 acknowledged participants' unique group experiences, while recognizing an opportunity to frame  
17 some of those experiences using characteristics that underpin what it means to be in a group.

18       For validity, although we adopted a critical realist orientation (Maxwell, 2012), we  
19 acknowledged that individual officials are positioned in unique contexts with many ways of  
20 interpreting their experiences. Consequently, appraising this work may integrate 'criteriological'  
21 indicators of quality, but the specific criteria used to characterize quality should be derived from  
22 the goals and context of the research (see Burke, 2016; Sparkes & Smith, 2009; Tracy 2010). As  
23 such, it is relevant to identify methodological tools that enhanced the credibility and transparency



1 bodies facilitated group interactions. Collectively, officials described experiences across  
2 organizational, task-specific (i.e., on-ice performance), and social contexts—with each context  
3 representing unique group characteristics and considerations. Embedded in these contexts and  
4 the group's impact on the individual, participants reflected on the nature of group-related  
5 processes they experienced. Using Carron and Eys' (2012) framework, data were primarily  
6 grouped into five themes representing central group characteristics. Two additional and unique  
7 themes were officials' transient nature and intra-team competition.

### 8 **Characteristics that Constitute a Group**

9 **Self-categorization.** As an essential characteristic for the classification of a group, all  
10 participants perceived themselves as group members. On one hand, officials consistently  
11 referred to the four individuals on the ice as a team, "We're a team on the ice—it's a team  
12 game...we're the ones working together, we're the ones coming together, and we're the ones that  
13 have to stick together [and] get each other's backs during the game." (R8) Alternatively,  
14 participants referred to their broader affiliations and identity as hockey officials, including  
15 descriptions of the larger officials association:

16 [We call ourselves] Team 21—we're the 21<sup>st</sup> team in the league, there are 20 actual  
17 hockey teams. We're a team out there whether you like the [other] guy or not. You have  
18 to respect him and you do have to be a team for that two and a half hours. For me, I think  
19 it's really important and the more I do this, the more committed I feel to that idea. (R7)

20 Officials stated that these shared identities ultimately facilitated group pride:

21 It's a pretty proud thing to go on the ice. Especially in the playoffs with a pretty packed  
22 arena knowing that you're the four that kind of control the atmosphere and the tone for  
23 the entire place. So it's a pretty proud feeling once you're out there, knowing that you've

1           accomplished enough to get to this level. It's a select few that get to do what you  
2           do...you still get goose bumps when you get out on the ice. (L2)

3           When describing group experiences, officials categorized themselves within their  
4           organization, and as on-ice groups. By categorizing themselves as belonging to these groups and  
5           valuing their membership, participants reflected on resulting experiences of pride and identity.  
6           The quotes exemplified that categorization was not only a personal experience, but a collective  
7           one where participants tied feelings of commitment and cohesion to shared identities as officials.

8           **Common fate.** Across participants, it was apparent that when a significant event  
9           occurred to one member, it influenced other officials. Influential events included specific on-ice  
10          tasks, or more general group-related perceptions shared among members, such as cohesion and  
11          conflict. For on-ice performance, all participants spoke of the degree to which their performance  
12          was influenced by on-ice partners. One participant described shared penalty call responsibilities:

13            You don't want to be the guy calling 10 penalties and you don't want be the guy who  
14            didn't call the 10 penalties. For the most part, in the four-man system, 50% of the calls  
15            both your hands go up [to indicate a penalty]—at least. The other 50% is in your zone in  
16            front of you. You get what I'm saying? [Penalty calls] should be fairly even. (L6)

17          Similarly, maintaining consistency in the application of rules was paramount: "You rely on your  
18          referee partner to be consistent, just like you hope to have some consistency. So whether it is  
19          [penalty calls] like holdings, trippings—things like that—you know you're on the same page."

20          (R9) Alternatively, when rule application was inconsistent, it could lead to conflict:

21            There's been some times, too, when you're right there and you see [the play]—you're  
22            like, "No penalty". And your partner's hand shoots up [to indicate a penalty]. I  
23            remember when [the four-man system] first came in, guys would lose their [expletive] in

1           the room on guys who called a penalty, but they go home and watch the tape and it's a  
2           penalty. Most of the guys have learned that when your partner calls a penalty you say,  
3           "Okay", and most of the time you just want to find out why it was a penalty. You just  
4           wanna get in his thought process. So you're like, "On that play what did you see?" And  
5           he'll say, "Okay, well I saw it this way." And you're like, "Okay, fair enough." (R5)

6   Beyond executing one's duties, every participant discussed the group-related perceptions that  
7   were contingent on interactions with fellow officials—notably, cohesion and conflict. Officials  
8   highlighted the need to act cohesively, recounting the importance of having similar goals to their  
9   officiating peers, and setting aside personal conflict for the group's benefit. One official stated:  
10           ...I had done a game with that guy and I put those feelings aside for the next 60 minutes  
11           because there was a task at hand to accomplish. It's never easy, it's always in the back of  
12           your mind, but you need to put it aside for the sake of the team. I'm still talking to him  
13           because we still have a job to do. (L2)

14           Participants indicated that team members influenced their on-ice performances. As one  
15   official reported, "If one guy screws up, it falls on the crew at the end of the game." (R8) Thus,  
16   common fate means that—despite positional differences, conflicts, and competition—the nature  
17   of their activity demands cohesion and fosters actions to form a shared vision (e.g., asking why a  
18   partner called a certain penalty). Such results also highlighted the importance of minimizing  
19   harmful behaviors (e.g., interpersonal conflicts) that negatively influence on-ice performances.

20           **Mutual benefit.** In ideal cases, officials' group experiences were rewarding—both by  
21   sharing social support, and by satiating desires to belong and feel connected. In terms of  
22   support, many officials expressed its necessity during stressful events, and how the predominant  
23   source of support was other group members:

1           It's important that referees feel part of the group, because they would use the group as a  
2           support system. The guys that may not be confident or saw something that they're not  
3           sure, they just want to go to the guys and say, "Hey, did I make the right call there?" or,  
4           "What did you see?" And if that group setting wasn't there, they wouldn't be able to do  
5           that—they'd just be sitting on the ice with a lot of thoughts to themselves. (R4)

6           Whereas support was typically provided during on-ice performances, belonging and  
7           feeling connected to the group extended beyond that environment. One participant eloquently  
8           described why these perceptions were so important for officials:

9           Nobody wants to be part of an association where they don't feel welcome. And I think  
10          the onus is on each member of the group as to the level of involvement they want to have  
11          within the group. I mean, I don't think it would be fun for somebody coming to work a  
12          game together and feel they are an outsider, or on the outside looking in. (L4)

13         Sense of belonging was often fostered by social activities that allowed officials to feel connected  
14         to the larger group, and these could be formal, (e.g., season-end banquet, referee vs. linesmen ice  
15         hockey game) or informal in nature:

16         Even if it's going to the [restaurant] down the street, splitting a pitcher of beer, and  
17         talking about the game. Or the experience—guys you haven't been on with a lot, maybe  
18         just talking about how the season's gone. Or if you haven't seen them since last year,  
19         how their summer was, how the family's doing. It's relaxing after the game just to kind  
20         of catch up with the guys. (L2)

21         Among the mutual benefits of belonging to officiating teams, participants discussed on-  
22         ice shared decisional support, while off the ice, participants described a sense of belonging and

1 feeling connected to team members. Thus, reciprocal interdependence was present, as officials  
2 gained something from membership, yet needed to contribute something in return.

3 **Social structure.** Participants reflected on the social structure present among officials,  
4 which was demonstrated by how members of on-ice groups and officials' organizations often fit  
5 within certain forms of subgroups, occupied individual roles, and shared normative expectations.  
6 Unmistakably, central fault lines divided officials into referees and linesmen, along with  
7 divisions separating those who were older and had more seniority with relative newcomers:

8 There [are] groups that stick together. You have the old-boys club, you have the guys  
9 that kinda grew up together refereeing that seem to be a lot closer, and then you have the  
10 younger guys that tend to stick together as well. And, you know [this younger group]  
11 could be a mix of referees and linesmen, or just linesmen. (R4)

12 These fault lines often distinguished those with more power in the organization. Accordingly,  
13 this structure also underpinned the roles that group members fulfilled; for instance, "We don't  
14 have an official crew chief, but I think it's unwritten that, 'Ok he's the more senior [referee], he's  
15 kind of the crew chief.'" (R1). Traditions or norms also followed:

16 There is also cultural stuff...typically rookies will give away their first game fee. So a  
17 rookie comes in and works his first game, but he isn't getting paid that night because the  
18 other guys take their money. Or if you happen to be somewhere where you can go out  
19 for dinner and drinks, the rookie buys those because that's his initiation...like,  
20 "Congratulations! You made the league." (R10)

21 Social structure provided the most insight into group divisions based on position (i.e.,  
22 referees vs. linesmen) and seniority (i.e., veterans vs. newcomers). Typically, referees had  
23 greater social capital (e.g., power) than linesmen, as evidenced by their informal appointment as



1 crew chiefs, even when a linesman had seniority. Meanwhile, veterans (regardless of position)  
2 typically prescribed group norms and traditions (e.g., mandating that rookie officials bought  
3 post-game drinks). Social structure, therefore, influenced on- and off-ice group experiences.

4 **Quality interactions.** All participants noted that communication was vital, which was  
5 categorized as quality interactions. Communication existed during competitions (i.e., task  
6 communication) and outside of competitions (i.e., social communication). Participants noted  
7 that, before each game, task communication was imperative to establish a shared understanding.  
8 Specifically, officials shared their on-ice tendencies (e.g., positioning, penalty standard) and  
9 knowledge of any players who would be participating in the game (e.g., players to keep an eye  
10 on). Task communication continued during performances, as evidenced below:

11 [During games there is] lots of verbal [communication] with the linesmen; they'll speak  
12 to each other out loud across the ice. There is also a lot of communication between  
13 [referees] and linesmen because they cross paths a lot. So the linesman that is standing  
14 on the blue line, on their way to the other end, the [referee] will always pass that  
15 linesman on the way to get into position [and ask questions] like, "What did you see there  
16 with the puck? Did it tip off the mesh? Did that high stick—was it actually high or was he  
17 jerking my chain?" (R10)

18 Participants explained that communication existed away from the arena, through social  
19 media or negative discussions about group members, which could have a detrimental impact:

20 Guys who speak negatively about other officials... if they're talking about those guys,  
21 who's to say they're not talking about you when you're not around. You lose that sense  
22 of community when you start to badmouth guys or put them down or talk about how this  
23 guy did a bad job or this guy. (R2)

1           Quality interactions extended to mentorship, as many officials noted that senior officials  
2 serve the role of mentor, aiding young officials' development through constant discussions of on-  
3 ice performance. Lastly, officials articulated that relationships/friendships are important:

4           Most of my friends now are referee buddies...my close friends are all referee friends. I  
5 golf with [a fellow official] quite regularly. There's other guys that I golf with quite  
6 regularly, and then there's other guys that I'll just go for a drink with from time to time.  
7 It's expanded my group of friends. There's guys that I never would have met that I've  
8 met through refereeing. (R1)

9           Considering that officials' on-ice tasks demand collective actions, participants described  
10 forms of communication that improved performance (i.e., task communication, mentorship). In  
11 fact, officials achieved teamwork mainly through on-ice communication. Friendship provided  
12 further evidence of quality interactions, as most officials described creating or strengthening  
13 friendships with other officials. Thus, quality interactions existed in multiple contexts.

#### 14 **Unique Elements Pertaining to Ice Hockey Officials**

15           **Transience.** Contrasting group definitions, a unique aspect of officials' groups was they  
16 were constantly changing. Participants recalled the challenges associated with the brief amount  
17 of time they worked with other officials—often switching partners from one game to the next:

18           The thing about 90 guys that you work with is, you're never working a lot with the same  
19 guys, so you're always concerned—you're always thinking about doing the right thing  
20 and making the right call—but you're also concerned about showing up at the rink on  
21 time and doing all the little things that made you successful to get to that point.

22           Particularly when you're meeting new guys. (R7)

1 Further emphasizing the unique challenges of such transience, one senior official highlighted  
2 how unlikely it would be for sport teams to adopt similar transient approaches, as doing so would  
3 likely decrease team performance.

4       When considering the challenges of transience, officials suggested that trust is heightened  
5 when working with familiar partners: “I think [familiarity] makes [performance] better because  
6 there’s that trust. As a referee group, you kind of have to—I’m not going to say rely on each  
7 other—but you have to respect their judgment and not overrule them.” (L3) Further, officials  
8 enjoyed themselves more when working with friends: “When I get a game and I see the four  
9 guys on the game and they’re all good buddies...I’m more excited to get to the game you know.  
10 The car ride, jokes, the game, the beers afterwards.” (R8) Despite enjoying working with  
11 familiar partners, officials noted that skill is prioritized over familiarity for important games:

12       I’d rather work with somebody I like. But if you’re working the [final game], that game  
13 means the most, and as tough as it is, I’d rather pick my buddy to [officiate] a regular  
14 season game. I definitely pick the guy that knows what they’re doing for the finals. (R3)

15       Altogether, participants believed their group’s transient nature was a salient construct,  
16 unique to their profession, and worthy of consideration in relation to individual and team  
17 performance. Participants even noted that their organizations set clear guidelines for members in  
18 terms of pre-game communication to facilitate communication among unfamiliar officials.

19       **Intra-team competition.** A second finding was the constant, underlying intra-team  
20 competition. Indeed, in addition to working as a collective group during competitions, each  
21 officials is rated individually by the organization, and ratings influence important game  
22 assignments (e.g., post-season games). Participants’ discussions began with post-season  
23 assignments as a measure of advancement and the competition to earn those positions:

1           Guys that are given a chance to go to the playoffs understand [it] is a great opportunity,  
2           and they've worked hard—you earned it. You've elevated your game and you are one of  
3           the best guys in the league. So there's respect that's gained and earned. (R6)

4           I'm out there to be the best, and I don't expect you to give me your [post-season] spot. If  
5           I'm going to get your spot it's because I'm going to take it from you and I'm going to  
6           earn it. If people have problems with that...they can kiss my [expletive]. (R8)

7           Participants also indicated the intricacies between individual goals for progression and  
8   managing the on-ice product with their group members:

9           As a team, you want to have the best product on the ice that night. We take great pride in  
10          what we do, so of course we all want to do the best job. But then, as individuals, you  
11          want to do the best job too—so you want to be the best official on the ice. That's how we  
12          get [to officiate in the] playoffs...and I think all referees are competitive that way. So it  
13          makes you work hard because if you're working with another solid guy, you definitely  
14          want to out-skate him or make sure you get all the penalties and stuff like that. (R5)

15          Finally, participants conceded intense competition could lead to negative emotions for  
16   deselected officials:

17          It's tough. There's lots of mixed emotions that come from either if he makes it and I  
18          don't make it. My supervisors all say I did very well—I don't know what his  
19          [supervisions] are if I can't see them. But I know that I did this well on the dry land stuff  
20          and he did very poorly. Or I know that I worked this many games and he's only worked  
21          this many. So there's mixed emotions—people get mad and people get happy. (L6)



1 group processes identified in ice hockey officials' groups, reinforcing the need for further  
2 research pertaining to additional processes that might influence officials' experiences at both the  
3 individual and group levels.

4         At the individual level, enhancing group experiences might be a practical resolution to  
5 address ongoing challenges with officials' attrition (e.g., Auger et al., 2010; Hancock et al.,  
6 2015). Though officials' involvement was secondary to other duties (e.g., employment), group  
7 experiences were motivating. It is worth considering the extent that social environments are rich  
8 enough to satisfy officials' basic psychological needs for competence, autonomy, and relatedness  
9 (Deci & Ryan, 2000). Presumably, positive group experiences reflect relatedness (e.g., 'Team  
10 21'). Additionally, our study demonstrated how groups support officials' feelings that their  
11 involvement is self-determined and autonomous (e.g., input into group decision making), along  
12 with perceptions of competence (e.g., social support). Satisfying officials' basic psychological  
13 needs through group processes could be an important avenue for officials' organizations to  
14 explore, with the goal of establishing positive experiences and commitment.

15         Regarding group performance, Steiner (1972) suggested that group effectiveness is the  
16 result of a group's potential productivity, subtracting process losses during performance. This  
17 seems applicable to interactions with officials' groups, as participants frequently alluded to  
18 process losses that impacted them, including poor communication, conflict, and lack of cohesion.  
19 For instance, officials stressed challenges when their personal philosophy about play-calling and  
20 communication conflicted with those of their on-ice partners. Considering cohesion and conflict  
21 share an inverse relationship in sport teams (Paradis, Carron, & Martin, 2014), the reciprocal  
22 cohesion-performance relationship (and by extension, the conflict-performance relationship;

1 Carron et al., 2002; Paradis et al., 2014) seems relevant for officials groups. We suggest  
2 officials' organizations investigate methods of enhancing communication and reducing conflict.

3       Indeed, on-ice officials' groups from this study were notably transient, though  
4 membership in the larger organization was not. Consequently, the potential for perceptions of  
5 cohesion to vary among the larger group (i.e., organization) and the transient performing teams  
6 (i.e., four-member officials teams) is worthy of further investigation. This might provide an  
7 opportunity to extend our understanding of group cohesion, its application to different groups,  
8 and particularly how cohesion forms in groups that continually shift membership.

### 9 **Uniqueness of Officials Groups**

10       The unique transience of officials' groups—whereby an individual performs with many  
11 officials during the course of a season—might influence on-ice performance. To manage the  
12 demands of such transient groups, participants debriefed with their group before games to  
13 discuss personal tendencies and past experiences. These processes link to the preparation phase  
14 of teamwork (McEwan & Beauchamp, 2014), and exhibit planning activities vital for enhancing  
15 coordination (Eccles & Tenenbaum, 2004). Officials' reflections on the benefits of shared  
16 understanding, rule knowledge, and protocols for on-ice interactions can be explored using the  
17 concept of shared mental models (Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000).  
18 Essentially, shared mental models represent a common understanding or similar beliefs among a  
19 group, and such coherence pertaining to the competitive environment could position officials to  
20 best adapt during challenging situations and predict other group members' actions. Thus, two  
21 applied strategies for adapting to group transience are: (1) establish common pre-game  
22 debriefing and planning practices, and (2) strengthen shared mental models by establishing a  
23 common understanding of rules, philosophy, and protocol.

1           Intra-team competition involved intense rivalry for prestigious post-season assignments,  
2 which are predicated on subjective officials' rankings assigned by supervisors during the season.  
3 Whereas these statements align with positional competition in sport teams (Harenberg et al.,  
4 2016), unique features existed. First, officials stated intra-team competition was superseded by  
5 the need for interdependence, cooperation, and teamwork (e.g., Carron & Eys, 2012) to ensure  
6 successful on-ice performance. Secondly, only two referees and two linesmen are assigned to a  
7 post-season game, resulting in elevated intra-team competition. Finally, a stark contrast is that  
8 competing teammates can typically see each other perform (either in practice or competition), or  
9 their performances are objectively measured (e.g., timed sports), while the transient nature of  
10 officials' groups makes this a near impossibility. It is important for researchers to examine the  
11 influence of intra-team competition on group dynamics, performance, and transience, while also  
12 investigating methods to reduce intra-team competition. This could include understanding the  
13 consequences of intra-team competition (Stanne, Johnson, & Johnson, 1999) and the relationship  
14 between intra-team competition, cohesion, and conflict (Harenberg et al., 2016; Paradis et al.,  
15 2014). Practically, officials' organizations ought to consider how to make post-season selections  
16 that minimize intra-team competition, possibly improving officials' performances.

### 17 **Officials Engage in Activities that Enhance Groupness**

18           Officials engaged in implicit and explicit approaches to enhance groupness. First,  
19 officials cultivated group identity, which was best embodied by Team 21. In the Ontario Hockey  
20 League (a branch of the Canadian Hockey League), there are 20 teams. Officials considered  
21 themselves the 21<sup>st</sup> team, with shirts and helmet decals resembling this identity, increasing  
22 perceptions of cohesion (e.g., Carron & Spink, 1993; Paradis & Martin, 2012). Considering the  
23 overt intra-team competition, these efforts to maintain a cohesive environment are important, and



1 research supports the ability for these interactions to facilitate performance, satisfaction,  
2 adherence, and efficacy (Paradis & Martin, 2012). Second, formal and informal mentorship  
3 existed, and officials spoke to the resulting impact on performance and development, as well as  
4 the connection to the officials' group as a whole. Peer leaders provided mentoring functions  
5 including instrumental functions (e.g., task instruction, career assistance) and psychosocial  
6 functions (e.g., role modelling, friendship), leading to increased confidence and performance  
7 (Hoffman, Loughhead, & Bloom, 2016). Lastly, officials described additional activities that  
8 enhanced groupness such as formal meetings, and shared travel/accommodations.

9        Opportunities exist, however, to implement theoretically-grounded group development  
10 and relationship building activities. Many of the activities officials described were unsystematic  
11 and not sustained—similar to team building in other organizations (Shuffler, DiazGranados, &  
12 Salas, 2011). Officials could build upon existing applied efforts to develop a shared identity  
13 (e.g., Team 21), which might involve integrating ways for officials to establish a unique identity  
14 each season, receiving input and acceptance from all members. Future researchers could  
15 investigate a team building protocol to be piloted and implemented across officials' groups,  
16 facilitating a direct team building approach. Finally, associations ought to explore formalized  
17 peer mentoring relationships by pairing senior and junior officials. Developing systematic,  
18 theory-driven interventions can increase organizational adherence and satisfaction (Hoffman &  
19 Loughhead, 2016), which might affect officials' confidence, performance, and development.

## 20 **Limitations**

21        Limitations of this research include generalizability and social desirability. Ice hockey  
22 officials frequently interact with each other and players (i.e., interactors; MacMahon & Plessner,  
23 2008), but not all sport officials operate similarly. For instance, gymnastics judges (i.e.,

1 monitors; MacMahon & Plessner, 2008) and soccer assistant referees (i.e., reactors; MacMahon  
2 & Plessner, 2008) have fewer interactions with athletes and other officials. Thus, we caution  
3 against generalizing our results to other sport officials—especially non-interactors. A second  
4 consideration was social desirability. During recruitment, we informed potential participants of  
5 the nature of the study, which was to examine group processes in ice hockey officials. As such,  
6 participants with negative group experiences might have declined to participate and readers  
7 should consider this, as well as the other limitation when interpreting our results and discussion.

### 8 **Conclusion and Applied Recommendations for Officials and Organizations**

9 Officials perceived themselves as group members (on- and off-ice), possessing unique  
10 elements (i.e., transience and intra-team competition), and engaging in activities that enhanced  
11 groupness. Importantly, several themes have practical considerations, and we have advanced  
12 five applied recommendations to guide officials and their organizations.

- 13 1. Institute team building activities to improve on-ice performance and reduce attrition.
- 14 2. Establish mentorships to pair referees with linesmen, and veterans with newcomers.
- 15 3. Create transparent policies to inform post-season assignments.
- 16 4. Minimize transience by creating smaller officials' groups that frequently work together.
- 17 5. Mandate standardized pre-game discussions that facilitate communication among *all*  
18 officials, with the aim of enhancing on-ice cohesion, while reducing on-ice conflict.

19 The above recommendations provide guidelines for officials' organizations, who ought to  
20 consider methods that facilitate group processes, thereby improving performance. The depth of  
21 our results highlights the need for continued research in this field to understand the impact of  
22 group processes on performance, retention, satisfaction, and well-being.

23

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**Appendix A: Interview Guide****Initial Questions**

1. I am interested in hearing about your refereeing involvement - what have you been doing recently as a referee?
2. As a referee, you work alongside other officials. Can you describe the extent that this job is individual, or relies on interactions with other referees?
  - i. In what ways do you interact with other referees?
  - ii. When do you interact with other referees?

**Opinion/Value Questions**

1. As a referee, can you discuss some of the things that might lead you to consider yourself to be part of a group or not?
  - i. What aspects of your relationships with other referees make you a group, as opposed to a collection of individuals?
  - ii. What characteristics make it a group?
    - a. Communication
    - b. Cohesion
    - c. Roles
    - d. Norms/traditions
    - e. Shared common goals
2. Now that we have discussed your experiences working with other referees in groups, could you describe the most influential group you've been involved with as a referee, if you can think of one?
  - i. What was it that made this group so influential?
3. You described a group that had a fairly positive/negative influence on your experience. Alternatively, can you describe an experience where a referee group had a negative/positive influence on your experience?
  - i. What was it that made this group so positively/negatively influential?
4. As a referee, you are often placed into a new working group for each game. Can you tell me about the challenges, if any, of this environment?
  - i. What would be some strategies that you could use to limit these challenges?
  - ii. Are there any organizational protocols or strategies in place to facilitate these situations?
5. Do you spend time with your fellow referees outside the sport setting?

**Feeling Questions**

1. In your own words, how would you describe what it means to be in a 'group' with other referees?
  - i. Common fate
  - ii. Mutual benefit
  - iii. Social structure
  - iv. Interaction
  - v. Self-categorization
2. Can you provide examples to demonstrate how feeling close to your fellow officials enhances or hinders your performance?
  - i. How does this happen?
3. Is it important for referees to feel like they are part of a group? Why or why not?

**Summary Questions**

1. If you had any advice for referee organizations about promoting positive referee groups, what would you suggest?
  - i. Do you think team building exercises would be beneficial?
2. Is there anything that you think we missed and should discuss with regard to groups? Do you have any comments or questions before we conclude the interview?