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COACHES' PERCEPTIONS OF VIDEO ANALYSIS IN COLLEGE HOCKEY

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Master's Project

Submitted to the School of Human Movement, Sport, and Leisure Studies
Bowling Green State University

In partial fulfillment of the requirements for the degree of

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SELF-REFLECTION & ACKNOWLEDGEMENTS

Heading into graduate school here at Bowling Green State University was an interesting time for me. I was stepping into a brand new university, the whole state was new for me really, and I did not know what to expect. I had to obviously meet new classmates and faculty, but the area of study was rather new for me too. Previously, I had worked with sport management at Columbia College Chicago, but nothing I worked on there required this level of determination and/or focus on my behalf.

However, once I was familiar with the work I was doing, the process turned into a challenging, yet rewarding cycle. That was until I reached my final year. My project was heading in multiple directions at the start of my fall semester. While my classmates were finalizing their own projects and ideas, I was struggling with a variety of ideas I could take on. Research Methods was the class that forced us to really focus on our own study, the study we would actually be conducting later in our spring semester. With the help of Dr. Spencer, I narrowed my idea down. My sights were now set on a topic I was truly passionate about investigating more.

With the Christmas break approaching, I knew I was on a tight deadline with all of the work that needed to get done. I managed to tackle the literature review rather quickly, in time to contact interviewees for the study. I contacted a lot of potential participants and luckily I was able to arrange interviews with three of them.

For me, this marked a turning point. It was the first time I would be showing another person this idea that was in my mind for all these months. I had previously done a mock interview earlier in the semester, but it was now showtime. Looking back on it, it is amazing to think that it took about two months to gather all the data in order to actually conduct my

research, yet the process of interviewing all three participants took place within a matter of a week.

The process opened the participants up to concepts and topics they had never thought of before. I take pride in knowing the fact that this could potentially have a positive impact on their coaching process in terms of video-based performance analysis. Additionally, without the prior year of learning, I doubt I would have been able to achieve something of this magnitude at all.

Finally, I would like to acknowledge the individuals who helped me make this all possible. First, I must thank my advisor Dr. Sungho Cho, who I first contacted two years ago in order to discuss a potential campus visit, and who has guided me throughout this process. Second, I would like to thank Dr. Nancy Spencer, who was instrumental in finding the study that was right for me. Beyond my professional acknowledgements I must thank my family for their love and support in completing this project. My father Gary, my mother Lucy, my brother Michael, and my sister Natalie for their support throughout my collegiate adventures. Also I must thank my lovely girlfriend, Kaitlin, who has read every word of this project a number of times and has been extremely helpful throughout the process. I would also like to thank my dog Jack, for being the only one home when I worked on this during the weekday afternoons.

ABSTRACT

Recent scholarly research has identified performance analysis as a significant part of the coaching process. With technology advancing every day, it has never been easier for coaches to analyze performance anytime or anywhere, no matter the skill level. While the what of performance analysis has been researched in-depth, the how and the why of the use of video-based performance analysis within this coaching process has been ignored. Therefore, with recent scholarly writing in mind, most notably Groom (2012), this study looks to further develop his empirically-based understanding of some of the realities of the use of video-based performance analysis feedback within the coaching process. The grounded theory methodology, utilized by Groom (2012), examined the what and the why of the delivery of video-based performance analysis in NCAA Division I men's ice hockey. The data was collected from interviews with three NCAA Division I men's ice hockey head coaches. The categories explored were Contextual Factors, Delivery Approach, and Targeted Outcomes. The findings of the present study have highlighted some of the what, why, and how of the use of video-based performance analysis within the coaching process. These findings build upon the existing coaching process model and add rich empirical data describing this complex process. In addition, the evidence-based research provides value to coaching practitioners, helping them become more reflective in their own video-based performance analysis within the coaching process.

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Chapter I: Introduction

Performance analysis has been gaining significant academic interest in recent years, and it continues to grow. Performance analysis has also established itself as an integral part of the coaching process (Carling, Williams, & Reilly, 2005; Hughes & Franks, 2008). With the introduction of digital video, coaches can now manage, code, and review video during half-time, intermissions, and even timeouts (Ives, Straub, & Shelley, 2002; Wilson, 2008). This has led to video review sessions being a part of weekly training programs at many amateur, collegiate, and professional organizations around the world (Groom & Cushion, 2004; Guadagnoli, Holcomb, & Davies, 2002; Mackenzie & Cushion, 2013).

For example, video analysis software (such as XOS Digital and DVSPORT Software) make it easier than ever for a coach to analyze the team's performance. Therefore, there is indeed educational value in using video-based performance analysis with coaching (Groom, Cushion, & Nelson, 2011). However, as Groom (2012) highlighted, "this increased academic interest has largely been focused towards discussions regarding: technological choices; the use of performance indicators; system design; and the reliability and validity of performance data" (p. 1). The focus of previous literature has in turn raised a number of issues and questions underpinning the research, such as, how to use this information within the coaching process (Groom, 2012; Mackenzie & Cushion, 2013). Additionally, Stratton, Reilly, Williams and Richardson (2004) held a similar viewpoint, stating that "even though coaches have greater access to video and other forms of technology, it is not yet clear how best to integrate this technology into the coaching process" (p. 132). Given how important this topic is for coaching and with every major sport league in America utilizing video-based performance analysis, it is surprising that very little attention has been given to the coach's point of view.

Performance analysis is presumed to be a well-researched, direct, and unproblematic system (Cushion, Armour, & Jones, 2006). With this in mind, researchers have a need for more evidence-based theories that coaches can utilize (Voight, 2007). An empirically based framework for this use of video-based performance analysis has been achieved thanks to the work of Groom, et al. (2011). Evidence-based theories raised by Côté, Salmela, Trudel, Baria, and Russell (1995) utilized an evidence-based theory that developed into a mental model of coaching knowledge. Côté, et al. (1995) has been a valuable cornerstone in exploring coaching practice (Lyle, 2002). This area of research, along with more recent findings (Groom, 2012; Groom, et al., 2011; Groom & Cushion, 2004; Groom, Cushion, & Nelson, 2011) have offered rich insight into coaching and performance analysis. These findings showcase how sport coaches need to be incorporated into future academic study in this area. Ives et al. (2002) noted that video may be the key to bringing the current research and coaches together.

Therefore, based on recent empirical work by Groom, et al. (2011) and Groom (2012), the present study will not only build on the existing body of research on video-based performance analysis, but will be tapping into coaching at the college level, specifically National Collegiate Athletic Association (NCAA) Division I men's ice hockey programs, which have yet to be researched in this manner.

Chapter II: Literature Review

Introduction

This literature review will look at the developments in performance analysis and sports coaching research. In light of Groom (2012), this review will be structured into four parts; first, it will outline the key areas of interest within the current sports performance analysis literature, and the foundation for the use of performance analysis in the coaching process. Second, it will cover the existing body of literature on the use of video and video-based feedback in sport. Third, this review will assess the current research within the coaching literature, and offer a critique of the foundation of the use of performance analysis in the coaching process. As a final point of analysis, this review will suggest ways research may better understand how video-based performance analysis can offer a practical viewpoint within the coaching process.

Performance analysis

Performance analysis is one of the keys of the coaching process, in which a coach has the ability to assess performance, detect problems, and deliver corrective information to the athletes (Lyle, 2002). Hughes and Bartlett (2002) suggested current performance analysis research should focus more on a 'performance indicator' system. This system is a "selection, or combination, of action variables that aims to define some or all aspects of performance" (Hughes & Bartlett, 2002, p. 739). Using performance analysis in this way accomplishes performance recording that is objective, accurate, and reliable (Hughes & Bartlett, 2008). No matter the game structure, 'basic rules' come to light by utilizing performance indicators to any sport (Hughes & Bartlett, 2002). Accordingly, it can be said that performance analysis is adhering to a method, that seeks to be true and consistent, both in quality and/or quantity (Groom, 2012).

While many authors suggest that together the coaching process and performance analysis ensure that feedback given is effective and accurate (e.g., Carling et al., 2005; Hughes & Bartlett, 2008; Hughes & Franks, 1997, 2004, 2008), little research has been presented to support such assertions (cited in Groom, 2012). Within this work, performance analysis authors tend to look heavily at in-game variables (i.e., shots, passes, etc.) and performance outcomes (i.e., win/ lose and goals scored) (Groom, 2012). Furthermore, Groom (2012) showed that authors sought out cause and effect relationships between a variety of variables, usually looking to identify game behaviors that relate to individual and/or team performance.

While this may seem applicable to coaches, Groom (2012) highlighted how this reductionist statistical approach focuses on reducing the complexity of the game data, and has yet to truly submerge itself within the coaching process. It is paramount that researchers acknowledge how a practitioner, such as a coach, could use the data/findings presented since little research has been done in this regard. Groom, et al. (2011) is an example of the type of research Franks (2002) was referring to; evidence-based practice research that informs coaching practice. However, a small number of authors (Groom, 2012; Groom, et al., 2011; Nelson, Potrac, & Groom, 2014) are indeed looking at more realistic approaches and gearing their research in more wholistic ways with more mundane realism.

In summary, a gap has emerged within the research between the performance analysis and the use of that performance analysis by coaches in reality (Franks, 2002). Previous research has often tended to ignore the real-world applicability of the research to coaches working in the field (Williams & Kendall, 2007). A more mundane approach, geared towards wholistic findings, may be required for coaches to grasp the data in useful and informative ways. The following

section will address the various ways researchers have attempted to connect the information to the coaching process.

‘Accurate’ and ‘reliable’ feedback within the coaching process

As expressed by Cushion, et al. (2006) and Mackenzie and Cushion (2013), existing performance analysis research attempts to reduce the complexity of performance by presenting it in heavily descriptive, systematic and unproblematic ways mirroring much of the coaching research to date. While this may be the case, Greenleaf, Gould, and Diffenbach (2001), have established that athletes are in need of feedback to sharpen performance. This opportunity can relieve issues and improve coaching communication to athletes while adding to the extensive research area (Greenleaf, et al., 2001; Ives, et al. 2002; More & Franks, 1996). Moreover, performance analysis also has the ability to link research to practice (Greenleaf, et al., 2001). Video of performance has been used by athletes and coaches alike for some time now to analyze and improve their skills and team strategies (Ives, et al., 2002; McGinnis, 2000). Video has the unique capability to replay, slow down, and capture key moments during a variety of game situations (Franks & Maile, 1991). According to Bandura (1997) this puts a stop to ‘performance ambiguity’ in which athletes are unable to view aspects of their performance thus not being able to improve upon them.

It is then determined that performance analysis serves a purpose: to give athletes the feedback they require (Groom, 2012). Yet, to date, a small number of authors have considered video-based feedback or video-based modelling in relation to the performance analysis literature (Groom, 2012). As a result, the next section will be geared towards video-based feedback and video-based modelling research.

Video-based feedback

Video-based technology has developed into a pivotal component in many of today's elite sporting environments (James, 2006). With the new and ever-changing video technology, it has never been easier to conduct user-friendly video analysis, no matter the budget (Bertrum, Martenluk, & Guadagnoli, 2007). As Boyer, Miltenberger, Batsche, Fogel, and LeBlanc (2009) have stated, video feedback has the unique ability to improve "the execution of complex athletic skills" (p. 855). In Bertrum, et al. (2007), gymnastics routines were the topic of investigation. Going even earlier in video feedback research, Rikli and Smith (1980) focused on improving tennis serve form by honing in on videotape feedback performance scores.

Dowrick (1991) noted that the process underneath the way video impacts the learner is still a new developing area of research. Furthermore, Groom (2012), in light of previous work from Bartlett (2001), Lyons (1988), and Stratton, et al. (2004), illustrated how currently, not much research is investigating video-based technology as a means to enhance athlete learning in sport. However, Fuller and Manning (1973) noted that video feedback has been applied to a wide variety of other research populations, such as; "alcoholics, families, probation services, psychiatrists, salesmen, students and teachers" (cited in Groom, 2012, p. 31). Similar to Bandura's (1986, 1997) social cognitive theory, Dowrick (1999) looked at how video was used to enhance learning, efficacy, and well-being within seven areas; (a) understand desired outcomes; (b) showcase a positive self-image; (c) understand the previous performance ability; (d) attention put towards observing capable role-play; (e) applying your skills to a new setting; (f) become anxiety-free or create desired outcomes despite anxiety; and (g) proving new skills from the preexisting subskills. In addition to the above mentioned self-modelling approach, Groom (2012) assessed that video feedback could reinforce positive performance and likewise be utilized to correct negative performance. Though this literature adds to the overall growing

number of studies that investigate the impact of video-based feedback, few authors have set their crosshairs on video-based feedback as a way to enhance athlete learning in sport. Moreover, Groom (2012) highlighted how, thus far, video-based feedback research in sport has produced equivocal findings, adding that a more wholistic approach is required.

While investigating the research on the effects of video-based feedback and video-based modelling, it is easy to get lost in the sheer amount of literature on the topic. Thus, it can be quite difficult to comprehend and compare various studies that utilized a wide variety of designs. Nonetheless, Groom (2012) noted that “the most common design used... is experimental pre-test/post-test design, either with or without verbal instructions from a coach” (p. 34). Regarding the research design, a control group was almost always used, but absent from the intervention (Groom, 2012). While some studies focused on a no feedback design, in which the subject did not receive any video or verbal feedback (Horn, Williams, & Scott, 2002; Rikli & Smith, 1980; Van Wieringen, Emmen, Boostma, Hoogesteger, & Whiting, 1989), other authors looked at video and verbal feedback from a coach (Bertram et al., 2007; Emmen, Wesseling, Bootsma, Whiting, & Van Wieringen, 1985; Van Wieringen et al., 1989). While some studies found performance improvements by utilizing video feedback groups and/or control groups, other studies did not (Groom, 2012).

With this research in mind, it is still not practical to judge the impact video-based feedback has on skill acquisition. As Groom (2012) affirms, it is apparent that a variety of intangibles are responsible for this complex phenomenon, such as; “personal (i.e., athlete characteristics), task (i.e., skill complexity), design (i.e., acquisition/training period), and environmental factors (i.e., learning environment created)” (pp. 53). Not unlike the performance analysis literature to date however, much of the methods and assumptions of the inquiry

paradigm conform to that of the (post)positivism paradigm (Brustad, 1997; Cushion, 2007; Groom, 2012; Mackenzie & Cushion, 2013; Smith, 1989). Once again, striving for 'accurate' and 'reliable' data undercuts the real world implication of the research to the practitioner (coach). In this regard, Cushion (2007a) argues that existing performance analysis research takes an overly simplistic approach (e.g. descriptive, systematic, and unproblematic) and thus consistently reduces the complexity of performance. With that said, the following section of the review will center on the prior approaches to performance analysis within the coaching process.

The coaching process

The term coaching process, according to Lyle (2002) described a series of activities and interventions, which could be formal or informal, that sought to improve performance. Despite the coaching process receiving increased recognition, there remains a lack of a clear conceptual foundation for sports coaching (Cushion et al., 2006). The result of this is a complete void of concepts and/or principles in place within the coaching practice (Cushion et al., 2006). No one model of the coaching process has yet to be consensually agreed upon (Groom, 2012). Though, Lyle (1999) stated that, "too many studies have adopted a quantitative survey approach [where] the need for the control of variables and reliable operationalization of constructs has militated against a more insightful and interpretive investigation of values, behaviors and context" (p. 30). As Cushion et al., (2006) noted, this has led to the majority of research claiming one aspect of the coaching process is superior over another. Ultimately, Jones, Armour, and Potrac (2004) expressed that the practitioners perceive this research as being irrelevant to them; not applicable to the real world (cited in, Cushion et al., 2006). In particular, the coaching process does not fit into the reduced application of generic rules since it is neither entirely reason-based nor planned (Cushion, 2001).

Both Cushion et al., (2006) and Lyle (2002) explored the models *for* and models *of* the coaching process. Models *for* the coaching process take an information based approach, assessing the knowledge and skills of the coach, an athlete's capabilities, performance analysis, the competition program, and the preparation program, among other things (Lyle, 1996, 1998). Meanwhile, models *of* the coaching process are developed by analyzing the expert coaches' practice (Cushion et al., 2006). These models *of* the coaching process can sometimes identify certain characteristics and occasionally find contextual differences versus the individual and team or performance and participation (Lyle, 2002). In turn, Côté et al., (1995) argues that this research can recognize the complexity of the coaching process and its context, yet never acknowledge this complexity in enough detail in the research findings.

Based on the models *for* and *of* the coaching process, Cushion et al., (2006) developed five key features that work to conceptualize the coaching process; (1) the coaching process is not always cyclical, but is continuous and interdependent, (2) the process, and practice, is ever-changing by a variety of 'objectives' that come from the organization, coach, and the athletes, (3) the process is a dynamically changing set of interpersonal relationships, the relationships are between the coaches and players, and ultimately the organization/culture, (4) the process is exposed to external limitations, in which some are controllable, and (5) the culture is imbedded in the coaching process via the coach, organization and athletes, and their interaction. It is important to address that Cushion et al., (2006) only sought to focus on the key themes of empirical works, not to reshape the current issues at hand. Lyle (2002) offers further examination of this topic by proposing his fourteen building blocks of the coaching process:

(1) The information platform – The information required to feed implementation, (2)

Coaching expertise – Knowledge and skills of the coach, (3) Performer capabilities – The

performer's current and potential capacities, (4) Analysis of performance – Knowledge and understanding of performance, Goal: Developing Athlete's personal characteristics and level of development, Coach's personal characteristics Competition Organization Training Coach's mental model of athletes' potential 5) Operationalization – The application within coaching practice, (6) Systematic development – Purposeful approach to improve performance, (7) Planning – Sequencing, nature and level of activities, (8) Goal setting – Giving direction and setting expectations and targets, (9) Regulation procedures – Adjustment of the process, (10) Monitoring procedures – Use of video, athlete responses and data collection, (11) Preparation and training program – The long term planning of activities, (12) Competition program – Engagement within a competition program, (13) Individualization – Designed to meet both team and individual needs, and (14) Personal and social meaning – Dealing with interpersonal activity.

(p. 99)

Groom (2012) concluded that the coaching process models are great analytical tools for a researcher. With the process, however, comes a loss of complexity due to oversimplification (Cushion et al., 2006; Jones & Wallace, 2005). In regards to future research, Cushion et al., (2006) explained that “the dynamic, social, interpersonal and situational nature of the coaching process is worthy of more attention” (p. 96).

Coaching as a social process

It has been stated that “despite the recent increase of research into coaching, the essential social and cultural nature of the process has received little attention” (Jones, Armour, & Potrac, 2002, p. 34). Jones et al., (2002) proposed analyzing coaching in light of role, interaction, and power; three interrelated concepts. Moreover, by utilizing these interrelated concepts, Jones et

al., (2002) maintained that social and cultural contexts, personal experiences, personal philosophies, and professional practice could be revealed and possibly highlight how all work together with one another. In terms of coaching, Jones et al., (2002) proposed that coaches are so ingrained in society they behave in certain ways to fulfil a role requirement. In relation to interaction, analytical tools such as 'impression management' or 'face work' are used to understand how coaches interact with athletes (Jones, et al., 2002). Jones et al., (2002) emphasized that social power is the "ability to get others to do what you want them to do" (Weber, 1978), or, the "ability to get them to do something they otherwise would not do" (Hardy, 1995, p. xiii). Jones et al., (2002) went on to note that power is not entirely imposed from top to bottom, but also often involves coordination from subordinate groups, without resistance and is highly adaptable.

Jones et al., (2002) concluded that "through a social inquiry into the everyday actions and strategies of coaches, we might gain a better understanding of the complexity that is the coaching environment, on how coaches attempt to manipulate it, and how they cope with the multitude of variations that exist within it" (p. 45). Drawing upon Lincoln, Lynham, and Guba, (2011), Groom (2012) suggested that the research process here is seen as a collaboration between the researcher and the researched with the goal of understanding and interpreting meaning. Groom (2012) importantly marked that this transition was important and guided the typical (post)positivist methodological approaches driven by behaviorist approaches, to a more naturalistic constructivist ontology and epistemology, in which interaction with the environment translated into understanding (Lincoln et al., 2011). In line with Groom (2012), the final section of the review of literature will outline a critique of performance analysis literature within the coaching process.

A critique of performance analysis within the coaching process

Drawing upon Hughes and Franks (1997), Groom (2012) noted that the majority of the performance analysis literature is based on coaching observations that are unreliable and inaccurate. Groom (2012) also supported that notational analysis, later termed 'performance analysis', was established from 'the coaching process and its problems' (Hughes & Franks, 1997, 2004, 2008). One of the key studies that this was based on was Franks and Miller's (1986) paper that aimed at assessing the observational strategies of expert coaches (Groom, 2012). Franks and Miller (1986) assessed "the observational accuracy of novice coaches (third year physical education students) during the viewing of an international soccer game" (p. 41). One of the other key studies often cited when looking at performance analysis in the coaching process is Franks and Miller (1991), in which they examined the possibility of training coaches to remember and observe (Groom, 2012). Neither of the studies examined so-called 'expert' coaches, with coaching ranging from "2 and 20 years" (Franks & Miller, 1991, p. 289), hence the accuracy of the claims are open to some criticism (Groom, 2012). Since the main reason performance analysis in the coaching process is used hinges on the research studies of coaches' recall and cognitive abilities, it is important to examine their relevance in modern sports coaching and potentially uncover additional methodological approaches within this field (Groom, 2012).

Since much of the literature tended to depict performance analysis to be a well-researched, direct, and unproblematic system showcasing idealistic models, empirically grounded models of performance analysis utilizing 'in action' approaches are needed (Cushion et al., 2006). Cushion et al. (2006) suggested that this is an important distinction since "the current set of models result in a representation of the coaching process that is often reduced in complexity and scale, and the essential social and cultural elements of the process are often

underplayed” (p. 83). Groom (2012) asserted in light of Cushion and Jones (2006) and Purdy, Potrac, and Jones (2008), that this research approach forgoes the real-world application of the research, since coach and athlete interaction do not exist in a vacuum, but rather in a disorganized contested human social context. Furthermore, Jones and Wallace (2005) suggested that more realistic research regarding coaching can be achieved by utilizing a ‘bottom-up’ approach. In turn, this could provide a more sound foundation on which other research can be built, resulting in more realistic guidelines for coach education (Jones & Wallace, 2005).

Conclusion and research problem

As Groom (2012) indicated, previous performance analysis research has emphasized performance analysis as a method of recording ‘accurate’ and ‘reliable’ data. Numerous studies have been cited to indicate this trend in performance analysis research. Additionally, suggestions from various authors have been made in order to combat this, highlighting applied efficacy to assist coaches in the real-world along the way. Ultimately, previous performance analysis research has raised issues in terms of its real-world implications within the coaching process. Moreover, of significant importance here is the transition from (post)positivistic methodological approaches to more recent constructivist based approaches, which attempt to understand the complex nature of sports coaching (Groom, 2012).

Adding to this, Groom (2012) stated that “to date, within performance analysis texts ‘the use of performance analysis within the coaching process’ has often been depicted in a simplistic, linear and unproblematic manner, stripped of social context” (pp. 90). Groom et al., (2011) added that the *what* of performance analysis has been well-researched (i.e., system design and reliability), yet the *how* we use this information is less understood. Consequently, Franks (2002) encourages more evidence-based research approaches in the future. Groom (2012) highlighted

how the findings of Cushion and Jones (2006) stressed the importance of society as a key player, especially within institutional performance environments (i.e., college men's ice hockey programs).

Therefore, a NCAA Division I men's ice hockey program is an ideal location for comprehending the realities of the use of video-based performance analysis within the coaching process. Thus, the main goal of the study is to examine head coaches' perceptions of the use of video-based performance analysis within their NCAA Division I men's ice hockey program, ultimately, building towards applied practice.

Chapter III: Methodology

Interviews

The purpose of the present study was to examine the what, why, and how of the use of video-based performance analysis by utilizing interviews as the central means of data collection. This allowed the participants' perspectives, thought processes, and life experiences regarding the use of video-based feedback in practice to be examined (Patton, 2002). Entering the participants' perspective was key to the interviewing process. However, unstructured, semi-structured, and highly structured are all terms that are often used to describe the approach utilized in a particular interview study. According to Markula and Silk (2011), "sometimes these terms are also used interchangeably...and refer to different aspects of the interview process" (p. 84). As one of the most popular methods of data collection, interviewing is user-friendly and flexible for participants and researcher to utilize with ease. Additionally, within these approaches, interviews may be conducted in a group setting, individual setting, formal/informal setting, face-to-face, over the phone, or even over email.

For the present study, the interviews were individual, semi-structured in nature with questions pre-planned using an interview guide from Groom (2012). The open-ended interview questions were used to explore the participants' views within a focused field of inquiry (Groom, 2012). This interview choice gave the participant the ability to explore the topic of their own personal point of view. Markula and Silk (2011) add that to "facilitate a more meaningful conversation about the topic, the researcher should ask open-ended questions that move the interview dynamically along" (p. 88).

While Parker (1996) and Potrac, Jones, and Cushion (2007) discussed how knowing the participants may be considered a potential source of bias, access to such elite environments is

particularly problematic (cited in Groom, 2012). In turn, Athens (1984) and Strauss and Corbin (1998) highlighted how the previous rapport that one develops with the participants allows for a greater depth of access and greater theoretical sensitivity to the research question (cited in Groom, 2012). A number of procedures were utilized in order to correctly represent the meaning of participants' responses. For example, I became an 'active listener' during the interview, often rephrasing and/or paraphrasing the participants' responses to result in further clarity. Moreover, once the interview was transcribed, a copy of the transcript was sent to the participant for further accuracy analysis. The interview guide was pilot tested on a retired professional ice hockey player very familiar with video-based feedback analysis. Along with getting familiar with the interview guide, I tested the recording device setup that was used for all the interviews.

Ethical Issues

Following institutional ethical approval for the graduate school, the key participants (i.e., NCAA Division I head men's ice hockey coaches) were contacted via email communication. Following this, all of the participants received voluntary informed consent forms, outlining the study. The purpose of this voluntary informed consent form was to inform the participants about the overall nature of the study while informing them of the potential harms and benefits of their participation. It was also agreed upon that all of the participants' names would be replaced with pseudonyms.

The data collected from the interviews was stored in a locked drawer, with only the people directly involved with the study having access to the data. Additionally, all email correspondence was password-protected through the email account and the computer from which it was sent to ensure confidentiality. Throughout the research process, participants were informed

that they could withdraw at any time without consequence; none of the participants withdrew from the study.

Participants

Three NCAA Division I head men's ice hockey coaches participated in the study. All three head coaches had a bachelor's degree and combined had more than 55 years of professional ice hockey coaching experience. Using pseudonyms the following section introduces the NCAA Division I participant coaches.

Jonathan was a 44 year old Division I men's ice hockey coach with a total of 15 years of coaching experience, with 15 years of full time professional coaching experience. Jonathan held the USA Hockey coaching certificate and had previously played professional ice hockey, although he had never received much video-feedback as a player.

Patrick was a 53 year old Division I men's ice hockey coach with a total of 29 years of coaching experience with 27 years of full time professional coaching experience. Patrick held the USA Hockey coaching certificate and had previously played DI ice hockey, and had received video-based feedback as a player himself.

Duncan was a 42 year old Division I men's ice hockey coach with a total of 13 years of coaching experience with 13 years of full time professional coaching experience. Duncan held the USA Hockey coaching certificate and had previously played professional ice hockey, although he had never received much video-feedback as a player.

Importantly, all participants had a minimum of three years practical experience of using video-based analysis in their coaching practice. The participants also exceeded the 10 years general coaching experience criteria adopted within a number of investigations which examine expertise within sports coaching (Côté, et al., 1995; Groom, 2012). Participants had a mean of 19

years ($SD = 7.1$) coaching experience, and 18.3 years ($SD = 6.2$) of full-time professional coaching experience.

Procedures

With the permission of each participant, confidential semi-structured telephone interviews were conducted with two of the participants, while a face-to-face confidential semi-structured interview was conducted with one participant; all interviews were audio recorded and transcribed verbatim, ranging in duration from 30 to 60 minutes. Moreover, the interviews began on February 11, 2015 and concluded on February 17, 2015. Based on Groom (2012), the initial phase of the interview involved describing the nature of the research and exploring the coaches' background and demographics (e.g., age, role, qualification, previous coaching positions, and time in their current position; see Appendix 1). Each interview started with general questions to produce initial lines of inquiry (e.g., "How do you use video analysis in your practice? What kind of things do you like to show the players?") (Groom, 2012). After this, questions were derived from previous field work (Groom & Cushion, 2004) and developing themes in the data (e.g., "How would you use the analysis with an individual player? Why do you use the analysis with the players like that?; see Appendix 1) (Groom, 2012). "How and why questions were used as a probe, along with a request for specific examples from the coach's practice to illustrate the points made (e.g., "Can you think of any examples in your practice where using the analysis has been successful? Can you think of any examples in your practice where using the analysis has been unsuccessful?")" (Groom, 2012, p. 145).

Data Analysis

Groom (2012) analyzed the data using a six stage process according to Strauss and Corbin (1998):

(1) As each interview was conducted it was immediately transcribed verbatim. (2) Via open coding, concepts were identified and their properties and dimensions discovered. (3) Via Axial coding, the data were reassembled into categories and their related subcategories, and concepts were redefined to form more precise explanations of the phenomenon. (4) Via selective coding, three categories (Contextual Factors, Delivery Approach & Targeted Outcome) were highlighted as providing 'analytic power.' (5) A literature review was delayed until the scheme of concepts, subcategories and categories had been developed. (6) A member-checking technique was used, which involved two of the participants being re-contacted at various points throughout the study to seek their views on categories from the data analysis in process similar to Holt and Dunn (2004). (pp. 146-148)

Based on the previous work from Groom (2012) utilizing this six stage data analysis process, I aligned my participants' responses to this framework. The main goal was to see if the Division I men's ice hockey head participant coaches were aligned with the soccer participant coaches Groom (2012) researched in terms of Contextual Factors, Delivery Approach, and Targeted Outcome.

Chapter IV: Results

Following the guidelines of Groom's (2012) grounded theory study in an iterative manner, themes were created from the transcribed interviews with the participants. With an emphasis on richly contextualized verbatim text, concepts were present and the relationships between the concepts were explored (Groom, 2012). From this, three categories were examined: Contextual Factors, Delivery Approach, and Targeted Outcome. The following describes each of these categories and explains using the subcategories and associated concepts from the current participants, three NCAA Division I men's ice hockey head coaches.

Contextual Factors

As Groom (2012) noted, Contextual Factors framed the delivery of the video-based analysis. This category consisted of six subcategories: social environment, coaching and delivery philosophy, presentation format, session design, and delivery process. Player and coach interaction was highlighted a number of times within the social environment of the delivery of video-based feedback:

I can get kids to believe in it and buy into it... I do think that I put a lot of onus on the player and the decisions he makes on a daily basis, in terms of his mental approach and in terms of his physical willingness to push himself outside his comfort zone. (Jonathan)

Here are other examples that showcase this interaction:

Players always want to know, 'hey, do this.' why? And you're always trying to explain why, why, well this is why. Now with video you have support to what you are trying to tell. So whatever you're trying to sell to the players to do video only reinforces or supports your point of view. (Patrick)

Moreover, Duncan explains:

I think that's the underlying thing that players want to know why, before it used to be, I would say 10 to 15 years ago, players were very content with just getting told what to do. Now when they are getting told what to do they want to know why they are doing it... And again, you are showing them the why of what they are doing and I think that goes a long way with their understanding, and their execution of the skills, or the concepts that you are trying to play with. (Duncan)

Additionally, the power video has on the player was emphasized, as Duncan highlights:

It's a great tool, obviously you're using it in a constructive way that's helping to develop your players, and develop your team... video can point out some of the things that aren't going well and you have to be able to make sure that you are using it effectively so that it's not negative, but it's more in a constructive way. (Duncan)

In this excerpt, Jonathan uncovered the role each player had on the team and its ultimate importance:

Video can improve their overall grasp of how we want to play the game. Specifically, for us the way we want to defend in our own zone, I think video can really help them understand what that looks like for us, and their role in that... This is what's happening, this is your role in that, that's really good, or it's not very good. (Jonathan)

Coaching and delivery philosophy examined the individual coaches' goals and how they would go about achieving that goal. An added point of emphasis here was put on the coaches' own view of the role he played on the team. What he felt his role was would ultimately affect his view on the particular goals for himself and the team. For example, Duncan stated, "I like to be known as a coach that teaches the players and likes to develop the players through teaching... A

competitive coach who focuses in on team development through individual development, through teaching.” Within the coaching and delivery philosophy, positive and negative video clips were established as key points for the player and overall team, as Duncan explains:

Some kids need more positive video than negative video. Maybe they are harder on themselves than they need to be and sometimes when you are showing them the positive things then they can kind of back off themselves a little bit. Some kids need to see the video to really get the accountability factor, where 'yeah, it is that bad', and here's why it's bad. (Duncan)

Patrick also exemplified how he focused on the positives more so than the negatives with video sessions, saying, “keep clips positive, but informative...it's all about having them learn and get better so you want to put them in situations, or show situations, where they can improve their game.” Negative video clips were shown to be embarrassing and sometimes obvious mistakes to the player making the mistake. The negative effects were worse when a player received this feedback in front of the whole group, as Patrick explains:

I don't feel like I need to call anyone out in front of the group if it can be, someone can feel really bad. It's embarrassing as it is. They know it, they probably heard about it from the coaches during the game, they don't need to go over it again before the group. I try to keep the individual stuff individual and the group stuff as a group, and try to keep it positive. (Patrick)

In terms of showing negative video clips, Jonathan provided a different perspective:

There are times where you say, 'I don't care. If he gets embarrassed watching this then maybe he won't do it again.' There are other times when you say, 'yeah, it's not worth showing this because it's so obviously bad.' It will come across as sarcastic or come

across as we just want to embarrass the kid in front of his teammates, and we don't necessarily mean to do that. It's a juggling act, it's consistent. Do we show this? Do we show that? Why this? Why not that? That's why, again, if you can, in front of the team, keep it to teaching and not using it as a motivational tool and maybe show the individual it to get them motivated, that's what we try to do. (Jonathan)

Moreover, coaching experience and video-based feedback experience was an important factor for the participant coaches. As Jonathan suggests:

You try to be right more than you're wrong. You're never always right. It does come with experience and you have to know your players. Because you know if you show this this kid's going to shut down, he's not going to respond to that. You don't want to have a bunch of guys like that. (Jonathan)

Additionally, participant coaches noted the importance of the player taking charge, with Jonathan adding "You're responsible for your actions. I don't like to have a bunch of rules." Duncan explains "I'm a guy that probably demands accountability in their work ethic and their commitment. I hold the players accountable, but at the same time using a communicative style so the players know the expectation."

The delivery process subcategory regarded the planning and implementation of the video-based performance analysis. Within this, Duncan highlighted:

You just get to know which players like it, which players don't. How long they like it. What they like to watch. Some players, like defensemen, may only want to watch their D-zone play. Some defensemen might want to watch their offense stuff. Forwards may want to see how well they get to their identity and what they need to be doing to be successful. They want to know if they are doing those things, or not doing them. (Duncan)

Within this delivery process, participant coaches showcased how important the review process was to the player, as Jonathan notes:

There's no reason video, from an individual standpoint with a coach, shouldn't be part of your weekly routine. If that means one day a week, two days a week, whatever it may be. Part of your weekly routine to review your games from last weekend, review your previous games, and kind of reset in your mind where you're at with your game, ask any questions you have, get them answers, and move forward. (Jonathan)

Presentation of the video feedback consisted of various group sizes, mostly from an individual and team basis. Patrick highlights the video session sizes:

Things that were maybe a common theme that we had problems with, but more of a common theme among everyone. More of a group thing. Individual things we will just show individually... Try not to individualize someone's mishaps in front of the group... But if our defensemen were struggling with the breakout, because they were doing whatever, we would show the whole team that. But if one individual was having a tough night, we would show him individually, and not the group. (Patrick)

Duncan adds to this separation of the groups:

We separate it out, we do the team video and then separate away from the team we will pull individuals aside, or make appointments for them to come into the office and watch their clips, or watch a certain situation before or after practice. (Duncan)

What the video sessions were about were equally important to the participant coaches.

Patrick expressed how pre-scouting the opponent with video “won’t exceed 10 minutes.”

Jonathan focused on clip duration as well, adding that he worried about showing “Too many

clips, and knowing that we are going to lose them after 10 [clips].” Likewise, Duncan noted that “duration is one of the biggest things that I try to be sensitive to.”

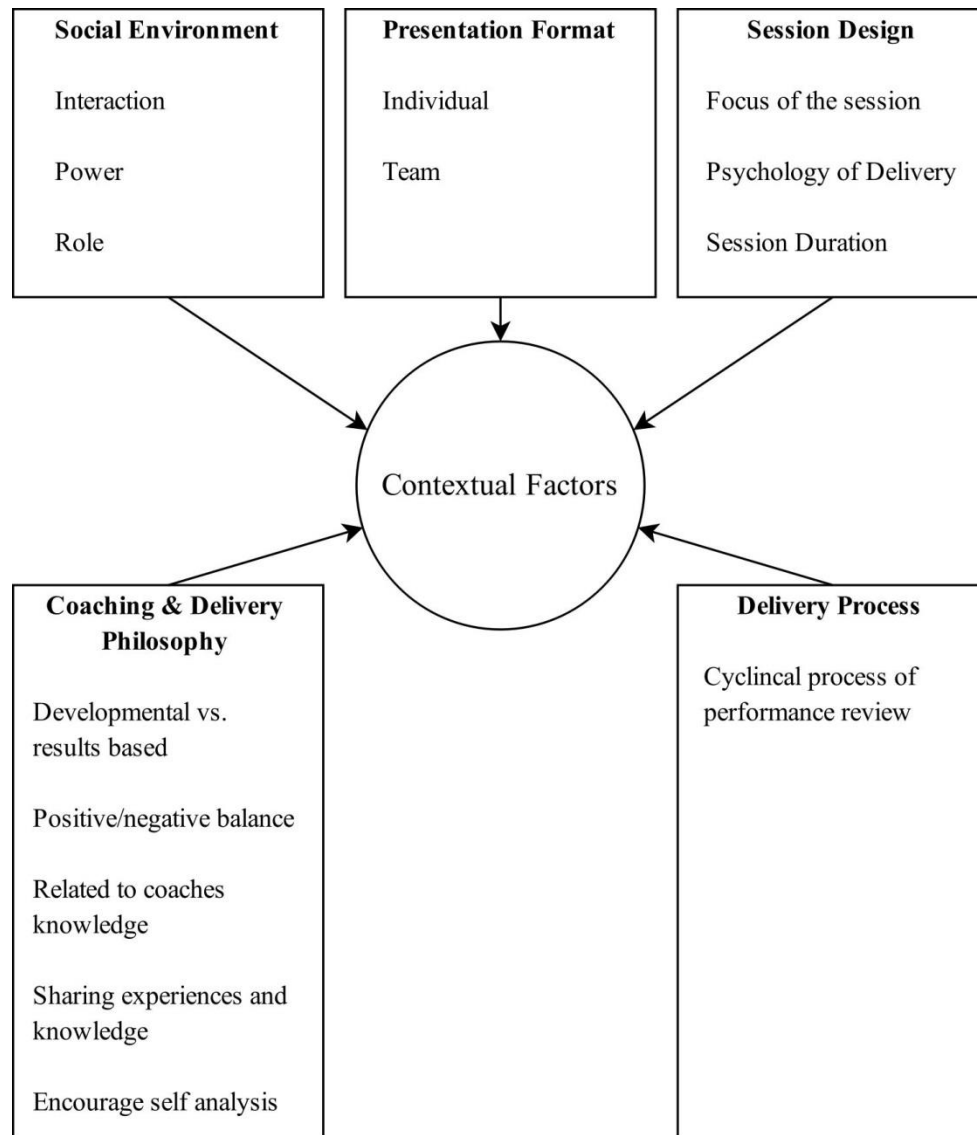


Figure 1. Overview of concepts, subcategories, and categories pertaining to the Contextual Factors of video-based performance analysis by Division I men’s ice hockey head coaches.

Delivery Approach

For the delivery approach category, six subcategories were highlighted; motivational use, opposition analysis, performance feedback, performance modeling, performance review, and

practice. Motivational video and imagery was used by some participant coaches. The following demonstrates this point:

Sometimes we even incorporate things that don't even relate to hockey into the video. It might be a movie clip, it might be a picture, it might be a song or something. You can use video as well for team building and culture. If things haven't been going well for your team sometimes you can use video to spark up some energy and some enthusiasm.

(Duncan)

Patrick noted the motivational use of National Hockey League gameplay footage to form credibility and engage the player more, "I think they enjoy it when they see themselves doing good things or, like I said NHL, they seem to like it when the star players are doing it."

All participant coaches utilized the video-based performance analysis to pre-scout, or analyze, the oncoming opponents. Jonathan illustrates how the team utilizes video for pre-scouting:

We watch all the specific chances for and chances against and we evaluate who is involved with those chances for and chances against. We use those chances for and against as teaching tools to show our team throughout the week, next week, as we prepare for the next opponent. (Jonathan)

Furthermore, Patrick uses pre-scouting video in a similar fashion, stating, "We'll watch our opponent this week, we watch normally on Tuesday and Wednesday. Wednesday we might show power play and plenty killing to those units in particular." Likewise, Duncan noted:

On the Friday night after the game you will watch the game and highlight something's from the game that are going to help you prepare for Saturday's game. At the same time, you are pulling out things from the game that individuals have done, or need to do, or

maybe some different ways of doing things that are trying to help for more of a short term purpose. At the beginning of the week we will use the video for our review of our team and how we played, and how the individuals played, and from that video we will show the team some of the team clips, where they are doing certain things that are part of what we do to be successful...one of our coaches each week will spend time breaking down the team that we are about to play so we can pick up on some of their tendencies, and help us in our preparation. (Duncan)

The participant coaches also made use of video-based performance analysis to give the players performance feedback. The coaches often discussed the clip that they were in front of the players, focusing on key reasons why the clip was important for them to view as a team.

Jonathan stated “I think the teaching tool, 'we need to do this better, we need to fore-check better, this is what a good fore-check looks like, this is what a bad one looks like', we use it for that.”

Jonathan pointed out that “they [the players] don't want to see themselves doing something bad for themselves or for their teammates. So they will change their behaviour based on what the video says.” Duncan added:

So we use it from an individual basis, one thing that we also use with our video is that we have it connected to our server on campus, so our hockey operations guy can actually add the players shifts into his file so he can go and watch his own shifts. I think that's more self-teaching, self-evaluation, when they are looking at it and sometimes those players will come in and they will talk to us about what they have seen, or they may have some questions or things like that. (Duncan)

This is an example of the power that video has for self-reflection purposes.

Moreover, the participant coaches showcased how important video-based performance analysis can be, stating “The powerful thing is the visual, the reinforcement, and showing how you want things done.” Duncan shared the same viewpoint, saying “I think the powerful thing about it is that it can reinforce the good things that you are doing and develop confidence within your players, or develop confidence within your team.”

Participant coaches also made use of the video for an ideal ‘model’ of performance. Even if a player had a bad game Patrick would find the positives, stating “You might have had a tough game or you didn't do well, but you did do a lot of good things you may want to show that we are on track.” He is cautious about selecting clips that “tend to be negative on players, individuals.” Duncan suggested that, “I also try to make sure it’s just not about things they are not doing. I want to make sure that there is a balance...maybe even in some instances more positive things than there are negative things.” Meanwhile, Jonathan expressed the idea of the video being “real” whether it was positive or negative, suggesting “there's more negative than positive. But again, I just look at it as real.” Jonathan goes on to highlight how “the video, to me, is not negative or positive it's real. It's the video. This is what happened.” He adds:

If we played a really poor game and lost, the vibe around the video is going to be more negative. Because that's real. If we're okay with not playing well and the video's saying we didn't play well that's not good enough. That's not the culture, that's the program we want to have... the video is real, if you don't like what you see in the video, change.

(Jonathan)

All of the coaches highlighted how they use a combination of positive and negative video clips, Duncan explains “It's easy to point out mistakes and I think it's natural to do that, but you can use video to show, or promote, developing confidence within your players and making them

feel good about what they are doing too.” Jonathan concludes that “You want to make sure there's benefit to what you're doing and it's helping. Whether it's negative or positive what you're showing its helping. And that's a constant battle, I think.”

Participant coaches also focused on the relationship between the athlete and the coach. The following is an example of the important of this relationship:

From the first day we met, we've been talking about relationships and we've been talking about trust. And the level of trust I want them to have is that they trust in their heart that I have their best interests in mind. Not my best interest. Theirs. And if they believe that, truly in their heart, we're going to be fine. And the relationship piece is one where if they feel like they can truly trust me to where there's a relationships there, then they'll come in and talk about it and they'll say, 'I don't like when you point me out in video. When you talk about me in front of the team in video I don't like that. That makes me shutdown.' Then I say okay, but you have to stop doing that, because what I showed you in video is real. That's you doing it. Something negative. So, if you don't like when I point that out then change and stop doing that. The video has helped us with that, because it's not 'remember that play?' and him saying 'that's not what happened.' The video says, here it is man. Here it is. That's what happened. If you don't have a relationship and you don't think you can trust me, don't come here. (Jonathan)

Within the delivery approach, participant coaches discussed team practices/training in regards to the use of video-based performance analysis. Patrick suggests that:

I think they can visualize, so if you're trying to show them a certain thing you'd like them to do. I believe in a lot of repetition in practice too, but I think if you could show something they may see it more clearly than if you try to describe something. (Patrick)

Additionally, some participant coaches explained that they do not use video during practices, but from a training perspective would perhaps benefit from using it. With a full roster, Jonathan noted that not every player has enough footage for training purposes from games, since not everyone plays. Thus, practice video-based performance analysis would be of use to them:

I do think that we are going to start to talk more about videotaping practice so we have more feedback for that player that's just outside looking in. Or even that player that's just inside looking out about what we're seeing in practice. Because maybe that player isn't playing 10 shifts a period, maybe he's playing two. So for us to give that good solid feedback, games are not enough. So we have to show clips of practice. (Jonathan)

Moreover, Duncan highlighted the transition from video-based feedback to on-ice performance situations:

For defensemen, sometimes you can show positional play when they are defending 2-on-1s and 3-on-2s, certain concepts that you want them to execute when they are defending those situations, video is tremendous at showing them that. And then you start to see it when those situations start to happen in a game, you have to give video a lot of credit for that so they can see it. (Duncan)

Patrick noted that “after Saturday's game we'll review our Saturday game Monday just before practice”. With the video still fresh in their minds, practice is where the player executes what he saw in the video sessions, or in the past weekend games.

Performance review was revealed as a subcategory within delivery approach, which involved the coaches watching the chances for or chances against, or even the entire game.

“After a weekend series you evaluate your team.” Duncan noted, as part of his weekly routine.

All the participant coaches watched the video before commenting heavily on the previous game, as Duncan expresses:

What I've learned is to keep your comments after the game kind of short, and to the point. Because you're going to watch the video and you're definitely going to have a different feeling about how the game went. And I think you can use the video, as a coach, just to get a better pulse on how the game actually went. (Duncan)

Similarly, Patrick established “I grade my players after every game and I don't do it until after I watch the video. The video has changed my mind an awful lot on players.” He further explains his reasoning below:

I think of a player that has one really great play or one really poor play that can hamper your perception of how they played in the whole game. I think if it's a good play you probably say, 'I thought he had a pretty good game', but if he had a really bad play, giveaway for the winning goal against, you would say well 'he was awful'. But then you watch the video and say 'he played really well after that point', it could just be that one mistake that was tarnishing. (Patrick)

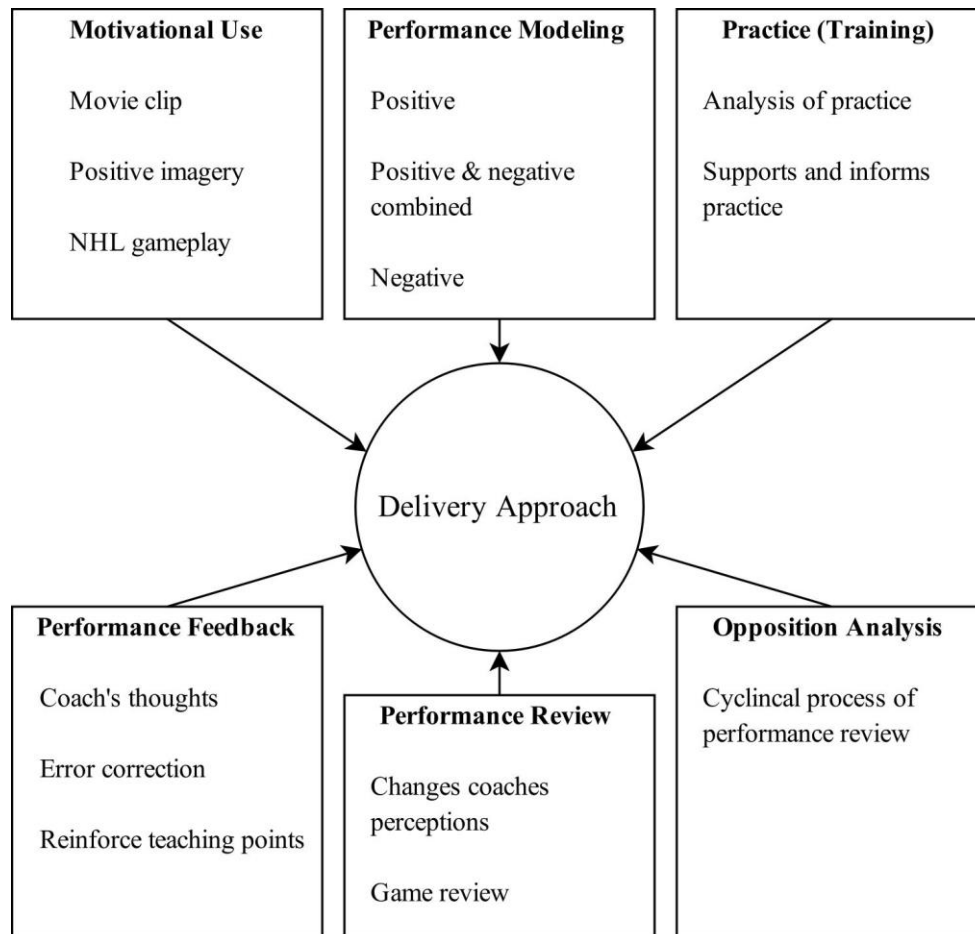


Figure 2. Overview of concepts, subcategories, and categories pertaining to the Delivery Approach of video-based performance analysis by Division I men's ice hockey head coaches.

Targeted Outcome

Three subcategories were present within the Target Outcome category: change behavior, facilitate learning, and improve efficacy. The participant coaches utilized the video-based performance analysis to increase player knowledge and to change player behavior. Jonathan mentioned that “when we want a behavior to change and it's a hockey behavior, we think the video is a good way to do that.” Patrick suggested that “players can visualize what I'm trying to tell him. So they understand what you're trying to explain to them. It's better than using a dry

erase board or whenever you try to draw something up, they can actually see it.” Changing player behavior on the ice was an important factor as well, Duncan explains:

I have seen that before where you show a player some things that they are doing and maybe they can be doing differently, or maybe do better, or maybe they're not even doing it. But I've seen it before and then the next night they go out they do it (Duncan).

Here, Patrick gives an on-ice example of this change in player behaviour:

We're not scoring because we aren't going to the net. We can show guys the goalie is clearly seeing shots from the blue line, no traffic's in front, and all that other stuff. Then you show that. We are showing them where rebounds go off of goalies. Shoot it at his pad, pucks come off this way. When you start showing that on video, it's, 'okay, I see that now'. (Patrick)

Another goal for the participant coaches was to facilitate learning through the use of video-based performance analysis. Likewise, to facilitate learning, coach and athlete needed to mutually understand each other; they needed to be on the same page. Jonathan summarized it as “Us playing the game the way we want to play it.” Duncan highlighted another example:

I think a lot of it [video-based performance analysis] is developmental, some of the physical stuff you are looking at some of their habits and their techniques and stuff you can use it for, but you could also use video to help educate them and help make them a more intelligent player... I think they all, everybody wants to get work towards what they could do better, or maybe things they are doing better, and I think it [video-based performance analysis] helps them with an understanding of how they are playing.
(Duncan)

Patrick highlighted how video can be helpful to exchange thoughts with the players:

Someone might of had a good game and maybe it's as simple as walking up, 'hey good game last night, we liked the way you played', that was one source of feedback, but then it could be after a series of five games, 'hey, after five games I thought you've done a really good job'. (Patrick)

For decision-making, Duncan provided a good example:

Shooting situations might be a good example of when to shoot it, where to shoot it, shot location, we've done that before where we would show them in certain situations that they are in that they put the puck in the right location, and again, if there is a reason why, maybe to create a second scoring chance. (Duncan)

Video was established as an important teaching tool for all the participant coaches.

Patrick suggested a positive approach, “If you show examples of their success doing different things I think it only supports what you're trying to teach them.” For Jonathan, video is a part of the game itself:

This is a teaching tool just like what you do on your open ice time, what you do shooting pucks, and working on your skating it's all the same to me. The video it's a little more mental preparation than it is physical. (Jonathan)

Improving efficacy was also of paramount importance to the participant coaches, Duncan illustrated that “if you are able to use video in that capacity you can develop a mentally tough team as well as use it to instill confidence in your team by use of video, by showing the positive things as well.”

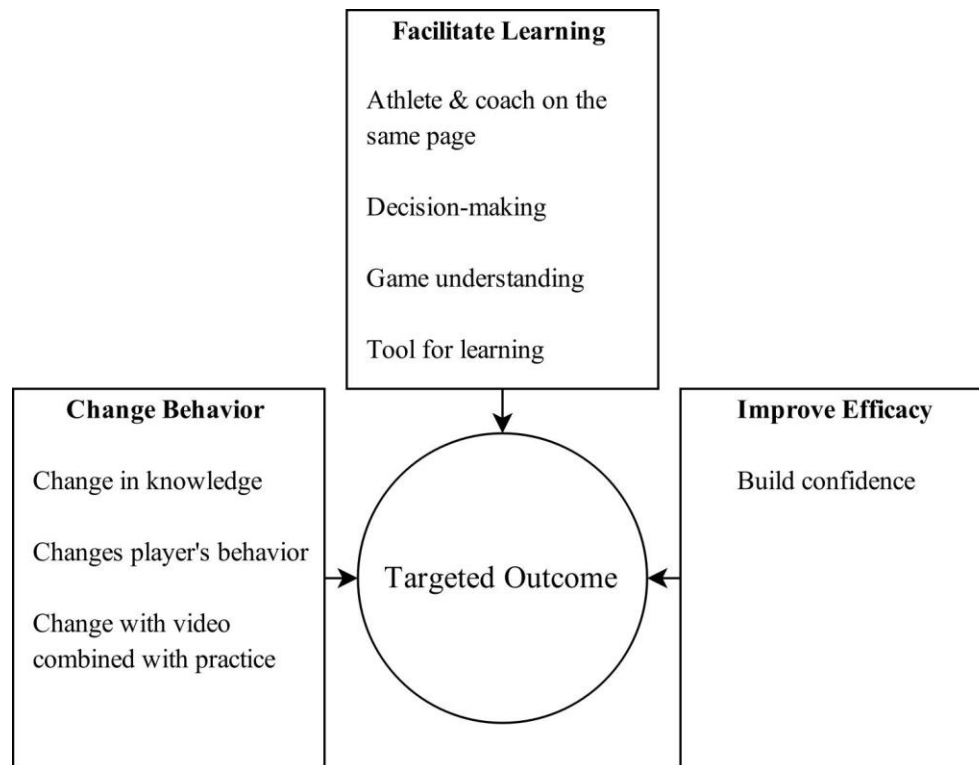


Figure 3. Overview of concepts, subcategories, and categories pertaining to the Targeted Outcome of video-based performance analysis by Division I men's ice hockey head coaches.

Chapter V: Discussion

The purpose of the present study was to examine head coaches' perceptions of the use of video-based performance analysis within their NCAA Division I men's ice hockey program. Specifically, the results of the study were arranged into frameworks with the literature review to see how they fit together. Ultimately, significant importance was placed on how the findings of the present study built upon the Groom (2012) dissertation in terms of understanding the delivery of video-based performance analysis.

Since the interview process brought up a sizeable number of responses in the results section, this discussion will focus on only the main takeaways from the findings. Additionally, this discussion will refer to the findings of Groom (2012) to highlight the similarities, differences, and suggestions for future research. Most importantly, this discussion will address how this study adds to the present body of research.

Within contextual factors, Groom (2012) illustrated how the coach-athlete relationship was acted out in the social environment he was researching. Examples of this interaction were present in this research as well. Every participant coach exhibited some form of demand on the athlete. This is highlighted in previous research by Cushion and Jones (2006) and Holt and Dunn (2004) noting that this form of interaction is how athletes often learn to conform to the coaches requests and 'obey orders' (cited in Groom, 2012). The power a coach has in this relationship can be utilized in different ways, as this research has shown. Likewise, Groom, Cushion, and Nelson (2012) examined how a head coach used a combination of expert power and direct informational power to "persuade the players that his analysis of the unfolding events is correct" (p. 448). On the other hand, participant coaches noted the importance placed on the role the individual players had on the team as well. This type of power was not highlighted in work from

Groom (2012). However, Groom (2012) along with Holt and Dunn (2004) did note that athletes needed to be 'willing to learn' and be 'disciplined', all pointing to the psychological competencies associated with the athletes.

Additionally, the research findings showed that the participant coaches were indeed mindful of the power they had. Cassidy, Jones, and Potrac (2009) suggest that this is an important factor when it comes to the coach-athlete relationship, especially when the coach ultimately would like to develop a positive learning environment. Similarly, the participant coaches were aware of the potential negative effects of the video and how it could negatively impact their development. Dowrick (1991) discussed that "viewing past behaviors can disrupt the natural evolutionary benefits associated with the degradation of memory or the creation of a positive glow, which usually serves to soften the negative impact of previous events" (cited in Groom, 2012, p. 153).

However, in the current study, participant coaches understood their power, and the coach-athlete relationship well and ultimately did not wish to influence their athletes in such a way; a positive learning environment was highlighted as being of the utmost importance. Within this regard, a more equitable power-sharing relationship was fostered resulting in a more positive learning environment for the athletes; in-line with Cassidy, et al. (2009).

Participant coaches expressed how experience and knowing your players were key factors in coaching and delivery philosophy. Cushion, Armour, and Jones (2003) explored coaching experience and learning, stating that "a large part of coaching knowledge and practice is based on experiences and personal interpretation of those experiences" (p. 218). Furthermore, experience, along with like-minded coaches, helps shape the development of a coach and impacts the way he or she does things within the coaching process (Cushion, 2001).

With the aforementioned findings in mind, participant coaches in this study were in line with previous research findings (Cushion, et al. 2003; Groom, et al. 2011). In that, the complexities of the delivery of performance analysis were highlighted as being a combination of the coaches' philosophy, an understanding of the individual athletes (including likes/dislikes with video), all while establishing a positive learning environment. Moreover, findings from this present study build upon the current research findings from pedagogically based coaching research. Potrac, Jones, and Armour (2002) utilizing a case study approach, found coaches were conscious of coaching points and ensured that they could hold the players attention (cited in Groom, 2012). Also, Jones, Armour, and Potrac (2003) established how giving too much information to the athlete could potentially pose a risk to his or her performance (cited in Groom, 2012).

The findings from the present study were aligned with Groom (2012) and Bandura (1986, 1997). In addition, the findings were supported by the work within the video-based modeling literature as well (Rikli & Smith, 1980; Van Wieringen, et al. 1989). Participant coaches perceived video-based performance analysis as a tool for teaching. Showing examples, whether positive or negative, showcased video as a reinforcement tool or as a bad performance deterrent respectively.

Once again in this category, the participant coaches expressed their use of video from a more positive approach. In accordance with previous research, the potential negative effects of viewing past negative experiences was highlighted by the participant coaches. However, in this regard, one participant did highlight how the video was neither negative nor positive, rather it was 'real'; it is 'what happened'. With this approach, little attention is paid to the positive images or negative images, instead, the participant coach would use what they are given. Within this

area, the participant coaches utilized the video in order to create a form of social learning in order to model good behavior (positive self-modeling).

Another key factor in this category was when the participant coaches watched the game later on video. The participant coaches tended to refrain from discussing the game in detail until they had an opportunity to watch the majority of the game. This delayed reviewing of the game appears to have a psychologically useful effect upon both coach and athlete (Groom, 2012). One of the key takeaways from this category related to the idea that the video could instill confidence within the athletes. In relation to this, Bandura (1986) highlighted that motivation is improved via tangible vicarious, social, and self-evaluation of performance.

Chapter VI: Conclusion

This study presented a framework to understand the delivery of video-based performance analysis based on the previous findings from Groom (2012). These findings build upon the existing coaching process model explored by Lyle (2002), adding rich empirical data describing the complex, interconnected process of the delivery of video-based performance analysis. Additionally, the present study further highlighted how previous literature (Carling, et al., 2005; Hughes & Franks, 2004) has revealed the complex social nature that exists within the delivery of video-based performance analysis.

This study highlighted what the participant coaches used video feedback for, how they used video feedback, and why they used video feedback within their coaching process. Likewise, Groom (2012) offered a unique point of view, stating “via the analysis of the empirical data (i.e., personal experiences, emotions, and pedagogical reasoning of the participant coaches’), it is argued that this is a more realistic representation and offers greater potential for coach education than previous research (Lyle, 2002; Voight, 2007)” (p. 173). In this regard, coaching practitioners are exposed to the complexities within video-based performance analysis that they would otherwise previously not be aware of. Additionally, Groom (2012) utilized the findings of Ives, et al. (2002), stating that with technology improving at a rapid pace, it is important for sport coaches and researchers to fully be aware that “even the most intuitively appealing technology requires thoughtful and reflective application to understand its effects within human interactions” (p. 173).

Since Groom (2012) did the first research of its kind, an empirically based account of the use of video-based performance analysis within the coaching process, this study should prove to be a step forward in other areas in sport this research could potentially influence. While it is

acknowledged that the present study showcased potential areas for future use, it is argued here that this represents an advancement within our understanding of the use of video-based performance within the coaching process. For example, future coaches could reflect upon their current practice and gain insight into how their desired Targeted Outcomes (i.e., behavior change, learning, improve efficacy, etc.) and their current practice are aligned to achieve these end goals (Groom, 2012).

One of the potential limitations of the present study was the rather small participant sample size. A larger sample size might have yielded a truer representation of the coaches' perceptions of the use of video analysis, however a fully saturated sample of all the NCAA Division I head men's ice hockey coaches is an unrealistic goal. Moreover, the small sample size further increased the level of detailed information obtained from each participant coach, something one researcher could not attempt alone with over 55 head coaches in Division I men's ice hockey. Perhaps another limitation is the focus on only Division I men's ice hockey head coaches. In future research, a variety of other sports, team-based or more individual-based sports, can be the subject of video-based performance analysis. This could potentially result in different coach-athlete relationships and/or video feedback approaches that could provide valuable comparisons of pedagogical practices. Ultimately, this could be used to better understand the similarities and differences in the delivery of video-based performance analysis across different coaching contexts.

Additionally, future research could utilize what was done in this study, testing a variation in the theory and see whether it works to explain other contexts and other participants experience of similar phenomena (Groom, 2012; Holt and Dunn, 2004). As Strauss and Corbin (1998) noted, this could ultimately alter the theory from a substantive theory to a more general theory

(cited in Groom, 2012). Finally, Groom (2012) emphasized how it is time to “start asking the tough, difficult questions within the field, such as: ‘where has this got us?’ and more importantly ‘where is this taking us in the future?’” (p. 271). I believe this study has answered the questions Groom (2012) set out to ask.

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APPENDICES

APPENDIX A

Coaching Demographic Information**Name:**.....**Age:**.....**Coaching Experience (Years):**.....**Years of Professional Coaching Experience:**.....**Highest Coaching Qualification:**.....**Highest Level Played at:**.....
.....
.....**Other Related Qualification:**

(e.g. Teaching Certificates, FA Tutor)

.....
.....
.....
.....
.....**Squads Worked With (please describe role head coach/assistant coach etc.)**.....
.....
.....
.....
.....**Have you ever received video analysis as a player? If so what was your opinion of it from a player's perspective?**.....
.....
.....
.....
.....

Coaches Perceptions of Video Analysis

Q1. How would you describe your coaching philosophy?

Q2. How long have you used video analysis for in your coaching practice?

Q3. Have you found using video analysis useful?

- How?
- Why?
- Specific examples from practice.

Q4. Can you think of a good example that highlights how you have found it useful?

- How?
- Why?
- Specific examples from practice.

Q5. How do you typically use the video analysis with the players/squad?

- How?
- Why?
- Specific examples from practice.

Q6. What kind of things do you like to show the players/squads?

- How?
- Why?
- Specific examples from practice.

Q7. What kind of things do you think it can improve in the players?

- How?
- Why?
- Specific examples from practice.

Q8. What do you think is the most powerful thing about using video analysis?

- How?
- Why?
- Specific examples from practice.

Q9. Do you think using video feedback with players can actually change what the players do in the next game?

- How?
- Why?
- Specific examples from practice.

Q10. Do you use video to prepare teams for a game?

- How?
- Why?
- Specific examples from practice.

Q11. Are there any things that you are cautious about when selecting video clips to show players?

- How?
- Why?
- Specific examples from practice.

Q12. Has using the video changed the way you reflect on the game or on individual players?

- How?
- Why?
- Specific examples from practice.

APPENDIX B



DATE: February 3, 2015

TO: Nicholas Czurylo
FROM: Bowling Green State University Human Subjects Review Board

PROJECT TITLE: [698039-2] Coaches' perceptions of the use of video analysis in college hockey
SUBMISSION TYPE: Revision

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: January 30, 2015

REVIEW CATEGORY: Exemption category # 2

Thank you for your submission of Revision materials for this project. The Bowling Green State University Human Subjects Review Board has determined this project is exempt from IRB review according to federal regulations AND that the proposed research has met the principles outlined in the Belmont Report. You may now begin the research activities.

Comment: In the recruitment script, there is a typo as the PI refers to the title of the project as "perception" rather than "perceptions."

Note that an amendment may not be made to exempt research because of the possibility that proposed changes may change the research in such a way that it is no longer meets the criteria for exemption. A new application must be submitted and reviewed prior to modifying the research activity, unless the researcher believes that the change must be made to prevent harm to participants. In these cases, the Office of Research Compliance must be notified as soon as practicable.

We will retain a copy of this correspondence within our records.

If you have any questions, please contact Kristin Hagemyer at 419-372-7716 or khagemy@bgsu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Bowling Green State University Human Subjects Review Board's records.



BOWLING GREEN STATE UNIVERSITY

School of Human Movement, Sport, & Leisure
Studies

Informed Consent

Principal Investigator: Nicholas Czurylo

Project Title: Coaches' perceptions of the use of video analysis in college hockey

Introduction: My name is Nicholas S. Czurylo and my advisor is Dr. Sungho Cho. I am a 2nd-year graduate student at Bowling Green State University in the Sport Administration program within the school of Human Movement, Sport, and Leisure Studies. The interview will form part of my Master's degree final project to examine the perceptions of the use of video analysis. As a head coach of a DI Men's Ice Hockey program, you have been identified as a participant who has a valued opinion regarding this research project.

Purpose: The purpose of this project is to gauge how DI Men's Ice Hockey head coaches perceive the use of video analysis in college hockey. Since the use of video analysis is relatively new, college hockey programs are just now starting to use this potentially game-changing tool to their advantage. I believe that it is important to learn as much as we can about the outcomes of this use of video analysis in college hockey. Research in this area has appeared recently, but nothing has covered college hockey specifically. This research will be important to many college hockey programs competing in the NCAA, not just Division I programs. With your participation, ice hockey coaches of all levels, including yourself, can potentially hone in on players' skills by using video analysis more effectively. There is no monetary award, or any other direct benefit, included in this research project.

Procedure: You will be an interviewee in an interview that I conduct. Using a previously published interview guide, I will target the following potential research questions: What is the general usefulness of the video sessions (Usefulness)? What had been learned in the sessions (Learning)? Whether the sessions had influences on their reflection on the games (Reflection). Whether the length of the session was right (Timing). Whether the video sessions had had an impact on any mental aspects (Mental Aspects). The single interview will range from approximately 45 minutes to an hour. Additionally, the time and place will be determined at the convenience of the interviewee. The interview may be conducted face-to-face, over the phone, or via Skype at the convenience of the interviewee.

Voluntary Nature: Your participation is completely voluntary. You are free to withdraw at any time. You may decide to skip questions or discontinue participation at any time without penalty. Deciding to participate or not will not affect your relationship with your institution, your co-workers, your student-athletes, or your job. Furthermore, participation or not participating will not impact coach's relationship with BGSU.

Confidentiality Protection: All participant identities will remain confidential throughout the entire research process. The data will be collected and placed in a secured and locked drawer. Only the people directly involved with the project (myself & Dr. Sungho Cho) will have access to the data. All email correspondence will be on a password-protected account on a password-protected

personal computer to insure confidentiality. I will be quoting participants directly, but will not reveal their identities or related institutions. A pseudonym may be used. To limit the risk of loss of confidentiality, original audio-taped interviews, from which the participants might be recognizable, will also be in a secured, locked drawer that myself and Dr. Sungho Cho only have access to. I plan on using all data for the purpose that I identified above and not for any other purpose without your knowledge or consent. After completion of the research project, all data will be destroyed and/or deleted to ensure confidentiality well after the data collection process.

Risks: Risks of participation are no greater than that experienced in daily life.

Contact Information: If you have any questions about the research project or your participation in the research, please contact me at my contact information provided below. You may also contact the Chair, Human Subjects Review Board at 419-372-7716 or hsrb@bgsu.edu, if questions and/or problems arise during the course of the project. Do not sign this informed consent form until your questions have been addressed to your satisfaction. Thank you for your time and consideration.

Nicholas Czurylo- nczuryl@bgsu.edu (847) 331-2050
Dr. Sungho Cho- scho@bgsu.edu (419) 372-6902

I/YOU HAVE BEEN INFORMED OF THE PURPOSES, PROCEDURES, RISKS AND BENEFITS OF THIS PROJECT. I/YOU HAVE HAD THE OPPORTUNITY TO HAVE ALL MY QUESTIONS ANSWERED AND I/YOU HAVE BEEN INFORMED THAT MY PARTICIPATION IS COMPLETELY VOLUNTARY. I/YOU AGREE TO PARTICIPATE IN THIS RESEARCH.

Participant's signature

Participant's name (print)

Date