

A Case Study on Professional Judgement and Decision Making Process in Athletic Training

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Abstract This case study explored the professional judgement and decision making process of an athletic trainer, specifically focusing on the athletic training of an elite jockey. Using the Professional Judgement and Decision Making theory as a framework, the study investigated the cognitive processes, beliefs, and factors that influenced the first author's judgment and decision making as an athletic trainer. The study employed a personal-narrative autoethnography approach, incorporating practice logs/diaries, consultations with the jockey, behavioral observations, and reflections. By integrating classical, rule-based, and naturalistic decision making approaches, the findings of this study underlined the complexity of the athletic trainers' judgement and decision making at different training levels—program, intervention, and session. At the program level, decisions were characterized by analytical planning, incorporating a deep understanding of the jockey's goals and the riding biomechanics. At intervention level, decisions were guided by both perceptual information and an intuitive understanding of the jockey's physical and psychological state, allowing for flexible and responsive training strategies. At the session level, rapid, intuitive judgements facilitated immediate adjustments to training plans, underscoring the dynamic nature of athletic training. In conclusion, this case study offered a unique glimpse into the professional judgment and decision making processes in athletic training, advocating for a reflective and open professional debate to advance the field. It calls for future

research to explore these processes across multiple sports and trainers, enhancing the understanding and application of PJDM in athletic training.

Keywords Decision Making, Athletic Trainer, Elite Jockey, Autoethnography, Case Study

1. Introduction

Athletic trainers perform a wide range of tasks within their scope of practice to provide comprehensive service for athletes and individuals engaged in physical activities. Such tasks include assessing the nature and severity of the injury, providing (where applicable) immediate first aid and emergency response, progressing to developing and implementing reconditioning programs, and optimizing athletic performance (conditioning), depending on the context of the athletic training [1]. On a daily basis, athletic trainers encounter complex problems that require them to make numerous judgements and decisions in order to effectively address these problems.

Various studies have investigated the practice of athletic trainers in case study [2, 3]. However, the majority of the case studies in the field of athletic training primarily focus on describing 'what we did' as a means of sharing practices for replication. For example, Zaffagnini et al. [3] reported the time taken for professional soccer players to return to

sport following a standardized rehabilitative protocol and undergoing clinical evaluation post-anterior cruciate ligament reconstruction. This type of reporting has its value, and rich descriptions can open up layers of practice that are useful to support offline case reviews, an important tool in the development of future professionals in space. However, description, no matter how rich, often misses both the ‘why we did it like this’ but also the decision-making processes (inclusive of perception and interpretation of key cues) that led to the processes that were followed, and indeed, those that weren’t [4]. To further advance the use of case studies, it is important to also delve into ‘why’ practitioners are doing what they are doing [4]. One such concept developed to support investigations in this area is professional judgment and decision making (PJDM). This tool has been designed to support the examination of understanding beliefs, values, considerations, judgments, and decision-making processes that underlie the behaviors of (amongst others) athletic trainers. Such understanding can be used to improve practices, provide future athletic trainings and deeper insights to inform judgment and decision making.

1.1. Theoretical Framework and Purpose

This case study employed the PJDM concept, drawing on theories of decision making, problem solving, mental models, professionalism and metacognition in a pan theoretical framework [5]. This framework explains the processes that determine how judgements and decisions are formed as well as the impact practitioners are intended to have on intervention outcome [5]. It is a theoretical framework that explores the cognitive processes, biases, and factors that influence the judgment and decision making of professionals in their respective fields.

At its core, PJDM acknowledges that judgment and decision making are not always a rational and objective process. Instead, it recognizes that it is shaped by a complex interplay of experiential, knowledge-based, and contextual factors within real-world situations. PJDM further distinguishes among different decision-making approaches: naturalistic decision making (NDM), which is a ‘fast’ decision arrived at by attending and responding to keys perceptual cues through a mix of tacit beliefs, heuristics and knowledge, explicit routines, and formal rules. Alternatively, decisions can be arrived at via slower classical decision making (CDM). This decision making process is more deliberate and analytical in nature, drawing on explicit rules and declarative knowledge, to clarify the goals and nature of problems and generate, often multiple solutions which are then considered before a decision of action is made. Of note, apart from times when a purely intuitive/automatic decision is taken, humans rely on rules or heuristics to guide both analytic and naturalistic decision making [6, 7]. This rule-based decision making serves as an intermediary between the intuitive speed of NDM and deliberate analysis of CDM. When explicit, this decision

making process is guided by established formal rules (e.g., perform a functional assessment at the beginning of any training sessions, and incorporate individualized exercises based on identified movement limitations and imbalances). When a tacit or semi-tacit heuristic is used, these act in the same way as rules, but are often hard or even impossible to verbalize and therefore reflect on.

Research into PJDM has received substantial attention in a range of fields, including applied sport psychology, medicine, teaching, military forces, and coaching [4, 8]. In the realm of sport coaching practice, Abraham and Collins [8] delved into the decision-making behaviour of 12 long jump coaches. Their findings revealed that these coaches predominantly relied on NDM, but when faced with uncertainty, their decision-making approach shifted more towards CDM. In a separate study within sport psychology conducted by Martindale and Collins [5], the focus was on a sport psychologist’s practice. This study unveiled the dynamic nature of PJDM, which aimed to impact the multiple layers—program, intervention, and session level of support. This led to the development of the *Nested Decision Making* concept, where fast NDM is nested with plans coming from a more thoughtful CDM approach [5]. Accordingly, the examination of PJDM at all levels has considerable potential for guiding the planning, conduct, and real-time adjustment of professional behaviour. Given this background we believe that the PJDM concept has the potential to provide novel insights to explore the nature of the athletic training for athletes, extend our use of case studies within athletic training practice and generate knowledge to inform developmental practices.

Therefore, the objective of this case study was to elucidate the decision-making process of an athletic trainer by examining the athletic training of an elite jockey. The research question guiding the study was: What is the process of PJDM on program, intervention, and session level of athletic training?

2. Method

2.1. Research Design

Based on the assumptions of an interpretive paradigm, this case study was informed by a personal-narrative form of autoethnography (AE). AE is defined as “an autobiographical genre of writing and research that displays multiple layers of consciousness, connecting the personal to the cultural” [9]. Specifically, in this study, I (the first author), took on the dual identities of academic and personal selves to tell autobiographical stories about my experiences providing athletic training for an elite jockey, enabling me to explore a particular social phenomenon by drawing on my personal experiences. The goal of this AE was to portray my experience through both factual information and my personal opinions, to evolve “in readers a feeling that the experience described is

lifelike, believable, and possible” [9].

2.2. Background and Context

I am a qualified athletic trainer with the Japan Sport Association and have been involved in athletic training for over 33 years, working with elite athletes in various sports such as marathon, tennis, basketball, volleyball, baseball, rugby, golf, track cycling, martial arts, and horse racing. In addition to my extensive athletic training experience, I have earned a Doctor of Philosophy (PhD) in sports science, with my doctoral thesis focusing on lower extremity injuries in tennis players. Additionally, I serve as a professor of athletic training at a university in Japan, where I educate undergraduate and graduate students in the department of sports sciences. My significant knowledge and practical experience profoundly influence my teaching, practice, and research in the field of athletic training.

This study focused on my three-year athletic training with an elite jockey, Makoto, a pseudonym. Makoto is a jockey who has achieved notable victories in horse racing, including winning multiple graded stakes races. I became involved with Makoto through a referral from a medical doctor who had been treating him for a fracture and undergone surgery twice at his right elbow due to a fall during a race. After those surgeries, there was difficulty in flexing and extending the fingers of his right hand, especially the little finger, which is crucial for gripping the reins of a horse. Therefore, the doctor requested me to help him improve the grasping function of the right hand. Following the doctor's instructions, I conducted a training program for about a month and a half focusing on the muscles related to grasping function of the right hand.

As Makoto's finger mobility progressively improved and signs of recovery began to emerge, he requested me to help with optimizing his athletic performance, and since then, I have been serving as his athletic trainer for more than three years. Our training sessions occurred once every two weeks and typically lasted approximately two hours. It is worth noting that Makoto achieved substantive comebacks after his injuries, and he continues to be recognized as a leading jockey at the time of the study. This AE-informed study aimed to better understand my judgment and decision making process as an athletic trainer working with him.

2.3. Data Collection and Analysis

The data presented in this case study were collected via a range of tools, including my practice logs/diaries, one-to-one semi-structured consultations with Makoto, behavioral observation, evaluation and feedback documents, and my own reflections. Three independent authors, each an established researcher in the fields of sport psychology and qualitative research, assisted me in maintaining perspective on the data. Together, we engaged in extensive dialogue and lengthy discussions, further facilitating the interpretation and understanding of my experience. My experiences were eventually reported using multiple layers of program, intervention, and session level through the lens of PJDM.

Specifically, at the program level, there was a deliberate engagement in nested planning, utilizing CDM strategies to frame the overarching problem and map out comprehensive approaches to address it, all while providing a thorough background on the knowledge structures involved and recognizing the areas of uncertainty. At the intervention level, the report was more specific about the expected timelines and outcomes, providing a clear and detailed roadmap for the intended progress and results. At the session level, the approach was characterized by adaptive 'experiments', actively responding to uncertainty, and continuously revising the plan to stay on track or to pivot strategies as necessary, ensuring a dynamic and responsive execution of the intervention.

We aimed to ensure the credibility, rigor, and sincerity of our research process through various means including persistent and extensive interaction in the field (i.e., over three years) and prolonged engagement and reflection (i.e., consistent and extensive note taking during the whole period and throughout the data collection, analysis, and write-up). The university's institutional board approved to implement this study (approval number: L2021-O17S).

3. Results and Discussion

Figure 1 illustrates a representation of my intentions formed in relation to the athletic training for the jockey across program, intervention, and session level. Details of PJDM will be discussed to illuminate key factors and demonstrate the multilayered coherence.

Level	Intentions	Timeline		
Program	<ul style="list-style-type: none"> - A posture characterized by a relaxed upper body and a straight back - An effective engagement of the core muscles to maintain control over the entire body 	1 year	2 year	3 year
Intervention	Above plus, for example: <ul style="list-style-type: none"> - Enhancing flexibility in the shoulder joints, thoracic spine, and scapulae - Enhancing core muscles utilization while mobilizing the muscles around the hip, knee, and foot joints 	Week 1 - 47		Week 47 -
Session	Above plus, for example: <ul style="list-style-type: none"> - Restoring the position of the scapula and humerus (issue of the day) 			

Figure 1. Multilayered nature of athletic trainer's intentions for impact across program, intervention, and session level of practice

3.1. Program-level PJDM

Program-level decisions are influenced by the practitioner's view of theoretical orientation and professional philosophy. As an athletic trainer, I believe my responsibility is to support athletes in achieving their goals, which are shaped through in-depth conversations with them. Therefore, my practice begins by gaining an understanding of their desired outcomes and specific movements they aim to accomplish. In the process, I prioritize comprehending the sensations they experience during their current performance and subsequently prescribe a program that is necessary for them to reach their goals.

When Makoto first approached me for assistance in optimizing his athletic performance, his consultation request was solely focused on returning to racing. In order to gain a deeper understanding of the riding movement he wished to achieve, I questioned him about his own ideal riding styles. Following this, he shared videos featuring jockeys who demonstrated the ideal riding posture he aspired to, along with footage of his own races. Specifically, he expressed the desire to develop a posture that would allow him to keep the stability in different race situations. Moreover, he told me that his right quadriceps is getting more fatigued, during the latter stages of a race. Therefore, we both agreed to focus on attaining a posture characterized by a relaxed upper body, a straight back and controlling his body's center of gravity to adjust to different race situations, while effectively engaging the core muscles to maintain control over the entire body. Based on this goal, I developed a program aimed at helping him approach his desired riding posture.

This process, which entails considering the athlete's goals, understanding movement sensations, analyzing video references, and developing the program, demonstrates a deliberate and analytical decision-making approach consistent with the characteristics of CDM [8]. These decisions were influenced by my beliefs about athletic training, which have been shaped not only by years

of experience and strong commitment to athlete-centered athletic training, but also by formal education in the field, including higher education and qualification course. This blend of practical experience and academic learning reflects a thoughtful and intentional decision-making process at the program level. Furthermore, this decision to invest time in developing a coherent, connected and informed insight into problem setting is crucial for avoiding future issues, or at least forestalling them and is typical of expert problem solving [6, 10].

3.2. Intervention-level PJDM

In this case study, the focus was on describing the PJDM underlying the implemented interventions during the first year of the program. The specific interventions were designed to align with the overall program goal while allowing for flexibility to adapt to changes in Makoto's body condition and the level of improvement.

Continuing with the theme of investing time in understanding the scope of what I was trying to help Makoto with, judgements in my evaluation were substantially influenced by perceptual information drawing on visual and verbal information provided by Makoto. I also assessed his riding techniques by watching videos of him actually riding a horse and controlling the reins, and by having him explain his sensations during those moments. This evaluation revealed that he exhibited a tendency to exert excessive force in his arms and shoulders, accompanied by a shrugging or elevated state of his scapulae, resulting in stiffness in his upper body. Furthermore, upon closer observation of his lower body, I noticed that his heels were positioned lower than the stirrup height, his feet were dorsiflexed, his left knee was slightly out, indicating external rotation of the hip joint, and his pelvis was tilted backward. These factors resulted in the hindrance to his spine's extension and his core muscles not activating properly. Considering that jockeys typically pull the reins in the opposite direction to the horse's motion to slow it down, and from a biomechanical perspective, it was

apparent that Makoto's overall riding posture generated a counterproductive load that hindered the horse's natural forward movement.

Additionally, in the training room, I conducted a visual and palpation examination of his whole body and posture, focusing on muscle stiffness and joint movement. I noticed that his left shoulder joint especially anterior part was too tight, then he could not stretch his chest and erect his back, as a result, he was not able to do external rotation for his left shoulder. When I asked him if anything came to mind these issues, he revealed that he had experienced a dislocated and fractured left shoulder due to a fall from a horse 20 years ago, and had not undergone rehabilitation for his left shoulder since then. Within this evaluation, I have referenced the role of 'noticing' several times. The capacity to notice is a reflection of skilled perception that has been developed over many years of studying and practicing. Noticing is a core part of professional judgement, since it supports the development of coherent problem set [7, 11].

Upon completing this thorough analysis, I developed an intervention plan aimed at supporting releasing tightness on left anterior shoulder joint, getting flexibility and movement of scapulothoracic, pelvis and hip joint mobility, abdominal strength for promoting a correct posture. Furthermore, the plan included aligning the stirrups with the heads of metatarsal bones, elevating the heels, and facilitating plantar flexion of the ankle joint to promote stability. Considering the ultimate common goal at the program level—attaining a posture characterized by a relaxed upper body, a straight back and controlling his body's center of gravity adjusting to different race situations of relaxing the upper body—the intervention initially focused on enhancing flexibility in the shoulder joints, thoracic spine, and scapulae, due to their proximity to or association with the spine. Specific exercises, such as contracting the erector spinae and retracting the scapulae, were incorporated.

After nearly a year of intervention, Makoto showed noticeable progress in his ability to retract his scapulae, engage his erector spinae muscles, and maintain a relaxed upper body while simulating riding on a saddle placed on a bench stand. Thus, I gradually increased the proportion of the intervention dedicated to the lower body, with a specific focus on enhancing core muscles utilization while mobilizing the muscles around the hip, knee, and foot joints. Such an approach was employed to harmonize the movements of the entire body, thereby promoting a more cohesive and effective movement pattern aligned with our goal.

Recognizing that despite investing in a significant level of diagnostic thinking to initiate both a nested plan and plan of intervention, plans should be consistently reflected and updated as new 'data' appears [12]. Thus, during the discussion regarding the issue of the rounding the back while riding, I intuitively noticed a potential contribution of muscle stiffness and immobility around Makoto's left

shoulder joint. This intuitive NDM noticing led to a more considered CDM investigation and was confirmed through assessment of the shoulder joint's mobility [8]. More specifically, the abduction of the scapula and the humeral retroversion restricted the extension of the spine, particularly affecting the limitation of thoracic spine extension and the reduction of the physiological lordosis of the lumbar spine.

In contrast to scenario above, a rule-based decision-making approach was employed when determining the specific exercises for the intervention [8]. Drawing from my practical experiences in athletic training for cyclists and baseball players, I believed that studying the posture and body usage of cyclists could provide valuable insights for achieving an effective body control and reducing air resistance while riding a horse. Additionally, exercises targeting shoulder flexibility, similar to those used in athletic training for baseball players, were incorporated. These decisions were guided by my past practical experiences in athletic training for both cyclists and baseball players and were also grounded in formalistic knowledge sources.

Regarding the timing of increasing the intervention for the lower body, the primary reliance was placed on NDM. I intuitively determined when to progress the intervention based on the holistic view on specific circumstances and Makoto's needs, without strictly adhering to a rule-based approach or relying on objective indicators.

3.3. Session-level PJDM

Since it is not possible to describe all of the daily sessions in this study, for the sake of brevity, I focus on illustrating the judgment and decision making process using a specific session as an example. The session typically follows a basic structure consisting of an interview, observation and functional assessment, exercises, and a summary. During the interview, I review the Makoto's race videos to gather reflections and ask about his physical condition. Then, I perform a functional evaluation of various body parts by asking him to do some particular movements. For areas that require improvement in movement, I allocate time for stretching or adjusting the order of approaches. Following that, the session progresses with some exercises, and as a concluding practice, Makoto performs the ideal riding posture using a saddle on a bench stand.

In this particular session, I identified significant tightness in Makoto's left shoulder and latissimus dorsi. Consequently, a substantial amount of time was devoted to functional assessment and stretching. Considering that the session took place the day before a race, the focus during exercises was improving body movements without causing fatigue, with an emphasis on flexibility and functionality. At the end of the session, we assessed the extent to which Makoto approached his ideal riding posture.

While the session generally adheres to the program and

consistent interventions, I remain flexible in addressing any issues identified during the interview and functional assessment. For instance, I allocated more time than usual for stretching the latissimus dorsi to restore the position of the scapula and humerus based on intuitive judgment during observation. The majority of the session involved such a rapid and intuitive thinking (NDM) [8]. When it came to evaluating whether the exercises were performed with the intended movements, rule-based decision-making [8] was applied using criteria developed through my significant knowledge and practical experiences in athletic training.

3.4. Practical Implications

Applying the PJDM concept, this case study has enabled us to gain deeper insights not only into ‘what I did’ in athletic training for the jockey but also the underlying judgement and decision-making processes (i.e., ‘why I did it like that’). We hope that this study acts as a model and contributes to building a comprehensive repository of case studies on judgment and decision-making in athletic training, which will inform and enhance future practices. Moving forward, we recommend that athletic trainer development programs include the creation of case studies based on participants’ own practical experiences. Incorporating the PJDM concept in this way helps athletic trainers critically reflect on their judgement and decision making processes, thereby becoming more reflective practitioners [13]. Moreover, integrating simulations and role-playing scenarios that replicate real-life challenges with these development programs, using the PJDM concept, can facilitate systematic reflection and provide some opportunities to debate their judgement and decision making processes in athletic training.

4. Conclusions

The core objective of this study was to elucidate the decision-making process of an athletic trainer, with a sub aim process of PJDM on program, intervention, and session level of athletic training. By sharing the approach and rationale for the practice of a professional practitioner we hoped to exemplify a reflective process through a PJDM lens. In so doing, it provides a point of open professional debate, crucial to the development of professions. We look forward to hearing others’ view. Equally we hope this unpacking will encourage other practitioners to do likewise. Case study is common in areas such as medicine and business, but we feel it should be more common across the sporting realm.

Consequently, this case study is the first to shed light on the professional judgement and decision making process in athletic training, drawing on personal experience and reflections. It draws on a single case study design. Thus, the findings are contextualized, limiting transferable

messages to other athletic trainers or sports. To further advance the field of athletic training, future research should consider conducting comparative studies involving multiple athletic trainers and athletes from various sports.

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