

Learning by Joining the Rhythm

Apprenticeship Learning in Elite Double Sculls Rowing

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Abstract

This article aims to explore how a joint rhythm is learned. The exploration is based on a combination of a case study of training in elite rowing and theoretical considerations concerning mutual incorporation of skills in learning. In 2009 Juliane and Anne start to row the double scull together. The two rowers' aim is to be among the exclusive group of teams that qualify for the Olympic Games three years later. However, Anne is not a rower, and has to be apprenticed by Juliane, who is an experienced elite rower. One important learning goal in the apprenticeship is to find a good joint rhythm, which will enable the rowers to put optimal effort into the rowing. Thus the apprenticeship is about developing a sense for a good rhythm in Anne which corresponds to Juliane's finely tuned sense of what a good rhythm should feel like. Our study suggests that apprenticeship learning has to be understood as an embodied and mutually affecting process rather than as unidirectional exchanges of information. This means that not only the inexperienced athlete is learning: the experienced athlete is also learning by compensating for the inexperienced athlete's inadequacy.

Key words: skill, expertise, mutual incorporation, coordination, elite sport, rowing, embodied learning, apprenticeship learning

Introduction

The following storyline frames our case study on the apprenticeship of two female rowers:

In November 2009 the elite rower Juliane Elander¹ is in need of a rowing partner. Her then partner for the lightweight double scull has ended her career and Juliane must find a new partner to have a chance of participating in the Olympic Games 2012. In her search, Juliane spots the elite kayaker Anne Lolk and her persistent attitude towards tough training in kayaking. She approaches Anne about starting up a training partnership in the double scull, aiming for participation in the Olympic Games less than three years later. For Anne this offer is very welcome as she has grown tired of kayak training and is searching for new challenges. Immediately the rowers start training together 6-7 times a week. Anne is apprenticed by Juliane.

From the beginning of their partnership one of the most important learning goals in their training is to find a good joint rhythm, because a good joint rhythm allows the rowers to put optimal effort into their rowing. Juliane has a finely tuned sense of what a good rhythm should feel like and this accompanies and guides her rowing. Consequently the rowers' apprenticeship is also focused on Anne developing a similar finely tuned sense for the rhythm, so the performance of the rowers becomes guided by a mutual understanding of what a good joint rhythm should feel like.

Two years later the two rowers prepare themselves for the B final at the World Championship in Slovakia. A second-place finish in this race will qualify them for the Olympic Games. The rowers row one of their best races yet. As they cross the finish line they are in a very tight race with the Dutch boat, fighting for second place. For a little while no one knows who came in first. But finally the result of the race is shown on the scoreboard. Juliane and Anne burst out in joy. The qualification is in the bag.

1 The real names of participants have been used. Prior to the study we informed the participants about our interest in providing them with anonymity in the presentation of data. However, the participants were interested in disclosing their names in order to make an example of best practice and therefore allowed the publication of their real names. We informed the participants about the consequences in case of lack of anonymity, and consequently we obtained permission to write their real names. In accordance with guidelines laid out by the Danish Data Protection Agency, their consent was obtained with the signing of a statement of consent.

In research on talent development in elite sport, social interactions are recognized as important catalysts in the training and development of expertise among elite athletes (Baker et al., 2003; Henriksen, 2010). Other studies indicate that the structuring and organization of athletes' mutual relations influence the athletes' experiences of participation and development of expertise (Cushion & Jones, 2006; Christensen, Laursen, & Sørensen, 2011). In this field of research, the focus is often directed at the macro-social organization of athletes' training environments, or more specifically at coaches' ability to verbally guide and motivate the athletes to more skilful performances. These social activities often appear to be conceived of as cognitive processes, which are somehow detached from the body. As a result, less theoretical attention is given to the role of possible transformations of embodiment in the learning processes in elite training environments. One reason why this topic is not given much attention by theorists might be that it involves exploring micro-processes of sensorimotor coordination, which athletes might have a hard time articulating. The role of the body in skill acquisition in sport has been addressed from a phenomenological perspective (Moe, 2004; Breivik, 2007; Eriksen, 2010). However, these studies are often non-empirical. Only a relatively few studies have – to our knowledge – explored the topic empirically (Jespersen, 1997; Wacquant, 2004; Downey, 2005; Ravn, 2009; Bailey & Pickard, 2010). It is common for these studies to emphasize that skill acquisition does not occur through intellectual analysis alone, but – as is precisely captured by Merleau-Ponty – “it is the body which ‘catches’ (*kapiert*) and ‘comprehends’ movement. The acquisition of a habit is indeed the grasping of a significance, but it is the motor grasping of a motor significance” (Merleau-Ponty, 2002:165)

Based on a case study of the two rowers' practice, the aim of this study is to explore the embodied learning of the rowers' apprenticeship. More specifically, we aim to explore the two rowers' learning experiences and how their bodily interactions enable them to develop a good joint rhythm.

The development of expertise and the role of embodiment in apprentice learning

By introducing the following theoretical perspectives, our intention is to situate our study and to outline a theoretical background for our interpretation of the empirical data.

The concept of “deliberate practice” (Ericsson, Krampe, & Tesch-Römer, 1993; Ericsson, 2007) has been influential and widely recognized within research on the development of sports expertise. The concept is connected to descriptions of how practitioners such as athletes develop the improved physiological adaptations and the complex cognitive mechanisms that are necessary for the development of expertise. Based on a study of skilled and less-skilled individuals in the music domain, Ericsson et al. found that not all forms of practice develop expertise, but expertise is acquired through what they refer to as “deliberate practice”, in which athletes are given tasks with well-defined goals, are provided with feedback, and have ample opportunities for repetition. Furthermore, deliberate practice characterizes learning situations in which athletes engage themselves in a practice activity with full concentration on improving their level of performance by following pre-specified rules and principles (often given by the coach).

In contrast, Dreyfus studied how expertise is acquired from a phenomenological point of view (Dreyfus, 2002; 2009). Dreyfus describes how an adult practitioner develops expertise over five qualitatively distinct stages. In the beginning, the practitioner follows rules often given by an instructor. Gradually, through trial and error, the highly deliberative behaviour of rule following is replaced by context-sensitive behaviour. Thanks to a vast repertoire of situational discriminations, the practitioner reaches a stage of expertise where his or her behaviour is no longer based on rules, motor programmes or representations but can be characterized as immediate, intuitive and situational. In contrast to Ericsson, Dreyfus emphasizes that the practitioner can only develop expertise if his or her experiences are assimilated in an embodied and atheoretical way (Dreyfus & Dreyfus, 2005). This means that the practitioner must cease letting pre-specified rules and principles guide his or her behaviour and instead act from an atheoretical perception of the specific task situation.

As exemplified in these two different accounts, descriptions of expertise development are often focused on individual processes. But even though Ericsson emphasizes the “solitary and non-social nature” (Er-

icsson, 2007:23) of deliberate practice, he stresses the importance of environmental factors, such as having the best trainers and best training environments. Thus, Ericsson shows that he is aware that individual processes are also a part of relations and interactions. Nevertheless, these environmental factors and the processes through which they influence the development of expertise need further elaboration. As an example, Ericsson stresses the importance of trainers' verbal feedback to athletes, but he does not go into detail about how a trainer becomes able to diagnose the kind of feedback that is needed for improving a specific athlete's performance.

At the first stage in the Dreyfusian skill model, the novice's learning is supported by receiving rules of conduct formulated by an instructor. Besides this, other people do not play a significant role in the skill model. However, in more recent descriptions of the skill model, Dreyfus introduces the concept of apprenticeship learning and how this might be a shortcut to further development:

If the learner watches someone who is good at doing something, that could limit the learner's random trials to the more promising one's. So observation and imitation of the activity of an expert can replace a random search for better ways to act (Dreyfus, 2009:37).

This emphasizes that practitioners can benefit from observing other experts or masters because this might suggest or demonstrate a new style of performing a specific skill.

Despite the fact that these approaches include social interaction as part of skill learning, they can be criticized for simplifying the role that others play in the development of expertise, because they do not thoroughly account for how interactions with others influence skill learning throughout the whole developmental process. The fact that athletes often train and improve their abilities in embodied interactions with other athletes in clubs and/or in national teams is not accommodated by the two theories.

With the term *community of practice*, Lave and Wenger indicate how expertise is not only a feature of the individual expert. Expertise is inseparably connected to the organization of the community of practice of which the expert is a part (Lave & Wenger, 1991). We suggest that the term "community of practice" in sport refers to a group of athletes who work together, share a passion for performing a specific sport, and learn how to do it better as they interact frequently. Thus the individual athlete

learns from being a member of and participating in the differentiated social structures which are established in the specific training environment. Accordingly, learning emerges from diverse sources and not only from the instructions which the trainer gives to the athletes.

Wenger emphasizes the importance of generational encounters in learning processes (Wenger, 1998). Generational encounters portray what might commonly be regarded as apprenticeship learning, i.e., interactions between accomplished old-timers and unskilled newcomers, in which the old-timer can be seen as a living testimony of what is possible, expected and desirable in the practice. However, Wenger emphasizes that newcomers do not passively receive learning in generational encounters, but actively participate and affect the encounter. Thus the generational encounter is likely to facilitate new meanings and therefore facilitates the development of both participants.

Going into operational detail, interactions in generational encounters are based on the participants' bodily and attentional coordination. Coordination² is an omnipresent and dynamic phenomenon in human activity (De Jaegher & Di Paolo, 2007; Fuchs & De Jaegher, 2009). Based on phenomenological insights, De Jaegher and Di Paolo define coordination as "the non-accidental correlation between the behaviors of two or more systems that are in sustained coupling" (De Jaegher & Di Paolo, 2007:490). The process of coordination requires that the participants engage the actions of each other. Based on the inseparable connection between perception and movement, both participants' actions become regulated by the perception of the other. This means that the participants behave and experience differently from how they would outside of the interaction, and meaning is co-created in a way not necessarily attributable to either of them. The process of coordination depends on the two participants' prior experiences of coordinating together. But a process of coordination can never gain a fixed or absolute structure. "[C]oordination can be like a swaying into and out of states that are close to stable, but not quite" (De Jaegher & Di Paolo, 2007:490). Accordingly, what is therefore also pointed to in De Jaegher & Di Paolo's descriptions is

2 In this article, we use the term *coordination* in order to understand how interactors affect (and eventually learn from) each other when being engaged in direct social encounters. In the motor learning literature (Newell & MacDonald, 1994) the term *coordination* is primarily used in relation to the degrees of freedom of the individual learner's movement organs. Thus the term is used to describe how the individual turns his or her body parts into controllable systems: "Coordination is achieved through the constraining of the degrees of freedom into a temporary coordinative structure in which a few parameters are free to vary" (Summers, 2004: 16-17).

that embodiment is to be understood as an ongoing process which is affected, reshaped and recreated through processes of coordination.

Leder's use of the term *incorporation* (Leder, 1990) supports and elaborates the notion of coordination by arguing that the lived body extends to whatever it is coordinating with. Leder describes that skilful incorporation comes into being "when something that once was [experienced as] extrinsic, grasped only through explicit rules, now comes to pervade my own corporeality" (Leder, 1990:31). In skilful incorporations the lived body dwells in intimacy with things and you no longer experience the object of attention as an external object exerting impacts upon your body, but "feel through it to the experiential field it discloses" (Leder, 1990:33). Similarly, in the process of social coordination, as explored by Fuchs and De Jaegher, the participants' capacities find extension through the lived body of each other, meaning that the participants' perceptions and actions are regulated by the embodied actions of the other on the level of operative intentionality, i.e., before the participants need to think about it (Fuchs & De Jaegher, 2009). Leder defines this as "mutual incorporation" (Leder, 1990:94).

These fundamental processes of social coordination enable the participants to learn from each other through what can be conceptualized as *guided rediscovery* (Ingold, 2001; Downey, 2005). The concept suggests that the old-timer's behaviour leads the newcomer to perceive the world differently, and thus to become aware of other opportunities for action. More specifically, the generational encounter enables the newcomer to reach for the knowledge of the old-timer, because the "formula" facilitating the old-timer's expert knowledge is not separate from movement in some sort of cognitive representation, but rather etched into movement in what can be conceptualized as *kinaesthetic memory* (Sheets-Johnstone, 2000, 2003).

[I]n the most basic sense, skill-learning is rooted in the capacity of one bodily presence to be attentive to another and to pattern movement along the lines of the other, imitating the way in which the other performs something, but also selecting the occasions on which one will and will not perform according to the methods of another (Sheets-Johnstone, 2000:358).

In this perspective the imitation of the old-timer's skills requires that the newcomer is attentively engaged in the actions of the old-timer as this will enable the newcomer to gradually recreate (i.e., learn) these skills

with his/her own body movements (Jespersen, 1997). Furthermore, the old-timer can support this process through the use of different scaffolding techniques (Ingold, 2000; Pea, 2004; Waquant, 2004; Downey, 2008b; Gieser, 2008). In sum, the direct encounter with an old-timer can develop the skill of the newcomer “by introducing [the newcomer] into contexts which afford selected opportunities for perception and action, and by providing the scaffolding that enables [him/her] to make use of these affordances” (Ingold, 2000:354).

Method

We adopt the single case-study method (Flyvbjerg, 2001, 2006) as our methodological frame, because as both emphasized and illustrated by Flyvbjerg, “the case study produces the type of context-dependent knowledge that research on learning shows to be necessary to allow people to develop from rule-based beginners to virtuoso experts” (Flyvbjerg, 2006:221). In generating context-dependent knowledge about the rowers, our aim has been to be sensitive to and make sense of the rowers’ learning experiences while also examining events and interactions transpiring between the rowers, and particularly between the rowers during practice.

Juliane (aged 32) is an experienced rower. She has more than 10 years of experience in competing at top international level. Also, Juliane has some sense of what it takes to qualify as a double sculler in an Olympic competition because she participated in the Olympic Games in 2008. Anne (aged 27) is a former world champion in kayaking. Bearing in mind Anne’s background in elite kayaking, she must be characterized as an insider in elite sport. She is accustomed to living a life dedicated to training and pushing herself to the limits of her capability. This is manifested physically most saliently in her strong upper-body physique. However, kayaking differs both in the technique and the physical demands (or physical profile). For instance, in rowing one does not face the direction of travel, and leg movements are an important and integral part of the stroke circle.

The empirical data were generated through participant observation (Spradley, 1980) and semi-structured interviews with the two rowers (Kvale & Brinkmann, 2009). The observations were made over 17 days

of practice attended over the course of five months from December 2009 to April 2010.

During the observations the principal researcher engaged as a “passive participant” (Spradley, 1980:59). This means he was present at the training sessions as a bystander, taking part in several informal conversations with the rowers before and after the training and in between training sessions.

In general, the rowers’ practice consists of indoor training in ergometers, outdoor training on the water, and different competitions. Normally, the training is built around predetermined series of time intervals with different paces (strokes per minute) that the rowers work through. A monitor on the ergometer (and sometimes in the boat) helps the rowers to keep track of the rowing time, distance, pace and “split” (i.e., the time the rower takes to travel 500 metres).

The principal researcher observed the indoor training, indoor ergometer competitions, and one training camp where the rowers practised on open water. Field notes were taken at the time, mostly in the form of cues and short sentences, and these were further developed into more detailed descriptions within hours of having made each observation. The notes included descriptions of transpiring events, conversations and preliminary theoretical reflections.

The interviews covered topics relating to the rowers’ background, their apprenticeship relation, their feel for good and bad rhythm, and how this was learned during their different training practices. The observations made during training contextualized the interviews and gave the principal researcher some actual and shared situations to reference during the interviews, and to have the athletes elaborate on. This way the rowers were invited to describe and further exemplify how they experienced their interactions and learning processes. This was also done in order to substantiate or validate the insight that the principal researcher had developed during the observations. During the interviews, the principal researcher also attempted to validate his interpretations of the interviewees’ statements through member checks (Kvale & Brinkmann, 2009). Interviews were recorded, and were maintained in this form and not transcribed.

The principal researcher analyzed the data through a theoretical reading (Kvale & Brinkmann, 2009), which means that the theoretical framework was used to facilitate interpretations of the data and discussions of the findings. This way the principal researcher attempted to interpret

what might go beyond the observations collected and the rowers' own descriptions in order to reach a deeper understanding of how their practices facilitate learning. In this process the principal researcher repeatedly reviewed the field notes, and listened to the interviews. In reviewing the data the principal researcher identified situations and themes that characterized certain aspects and processes of learning within the rowers' practice sessions, such as the rowers' sense for good and bad rhythm, getting a feel for each other's rhythm, etc. Throughout this process, the principal researcher played devil's advocate (Kvale & Brinkmann, 2009) by looking for disconfirming data, questioning his own reading, and developing and testing interpretations in dialogues with co-researchers.

Findings and discussions³

What characterizes a good joint rhythm?

From the outset, it became apparent that connecting in a good joint rhythm is an important condition for delivering a top performance in double scull rowing. As described by Juliane:

When you hit it spot on [connect in a good rhythm], you are able to row at your limits, because the technical skills are in place, and this is not what restricts you. It feels good when this is the case. It is like a technical privilege. [...] it is frustrating when it [the rowing] feels heavy or when you feel unable to let go or do your best. In this case you know that your training was not optimal (Juliane).

Double sculls rowers are directly and immediately affected by the movements of their partner, because the rowers are rowing in the same boat. Thus it is important that the rowers' movements do not work against each other, but instead find a common ground in a joint temporal pattern or rhythm. As described above, connecting in a good rhythm is not only a gratifying experience; it also stimulates the rowers to row at their limits and do their best.

In the following analysis of how the two rowers learn to row in a good joint rhythm, we start by framing the different ways in which the rowers perceive and perform rowing due to their different movement histories. Subsequently we thoroughly examine the training situation in

³ Words and expressions in quotation marks not accompanied by a citation are the words and expressions used by the rowers during interviews or observations.

which the two rowers are coupled together, as this situation is described by the rowers as suitable for teaching and learning to achieve a good joint rhythm.

Different ways of perceiving and performing rowing

Our study shows differences in the ways the rowers focus their attention during rowing and in their ability to distinguish between different rowing rhythms. These differences formed the point of departure in the rowers' collaboration.

The rowers' attentional focus during rowing

Because I have been allowed to be stroke⁴ for so long, I am pretty confident about my own rhythm. I can always find it [...] I know what I want it to be like [...] the important thing is to maintain an easy rhythm [...] it is about finding this flow and jab to it so [your strokes] are flowing and you do not feel that you need to start all over [with each stroke] (Juliane).

Juliane's rowing is guided and animated by a distinct memory of what a good rhythm has to feel like. Juliane therefore highlights that her expertise in rowing includes a certain way of working and remembering her kinaesthetic sensations (Sheets-Johnstone, 2000, 2003). This means, for example, that the sedimented dynamic pattern of – what she resonates to as – good rhythm seems to enable her to achieve a good rhythm while rowing. More specifically, Juliane's memory of the good rhythm seems to be etched into her movements, meaning it is sensed while she is rowing and at the same time affecting the way she rows. Furthermore, this practical activation of her extensive rowing history seems to subordinate the interaction between Juliane and the boat/ergometer to her practical interests such as maintaining a good rhythm. Thus Juliane is rarely forced to articulate reflectively the principles upon which her rowing is based. The accomplishment and adjustment of her rowing seem to take place in the background of her attention in response to an ongoing perceptual monitoring of the evolving rhythm. In this perceptual process Juliane treats her own body and the boat/ergometer as an integrated whole, which then allows her to focus her attention on, for instance, her

4 The "stroke" sits in the tail end of the boat and sets the pace and rhythm for the other rower to follow.

pace and rhythm and the pace and rhythm of others. In short, Juliane's movement history seems to enable her to skilfully incorporate the boat/ergometer (Leder, 1990) and allows her to sense and act *from the point of view of it* (Crossley, 2001).

Anne explains that she is able to do something similar when rowing in the kayak, but this was far from being the case when she started to row in the rowing boat.

Anne initially had a tendency to "slide with her seat", which means stressing the recovery phase of the stroke cycle.⁵

I slide with my seat, because I slide on the last part [of the recovery phase] and put the blades in the water in a swift motion. At this last part of the movement you are the most vulnerable. At this point you are squeezed together, preparing to put the blades in the water. If, at that point, you are hit by a wave or a gust of wind, then you just think: "Oh ooooh!" This part of the movement is the most difficult to balance. Therefore it can be tempting to slide with the seat and smack the blades back in the water to regain balance [...] if you haven't rowed in the boat before; it comes naturally to you to slide with the seat. But to make use of the way the boat is constructed, you have to do the opposite (Anne).

Through her many years of rowing the kayak Anne has built up an upper-body strength which is unusual among female rowers. Her way of employing this upper-body strength seems to work against an incorporation of a technically correct rowing stroke. It hinders her from generating enough thrust with her legs, which is an important part of performing the stroke correctly. Furthermore, trying to do the correct movement seems to make her feel out of balance and vulnerable. Instead Anne is "tempted" to employ an incorrect technique because it feels more "natural" due to her prior expertise in kayaking. Anne is not all of a sudden able to wipe the slate clean when faced with the situational demands of rowing. The kinaesthetic memory that she has acquired through her kayak practice is carried forward into the rowing boat. It animates her present experiences and actions in a way that is counter-intuitive to the style of movement that is needed for being able to row adequately.

Anne is aware that her movements are not fully adjusted to the technically correct stroke (cf. the above quotation about her tendency to "slide

5 The recovery is the part of the stroke where the blades are out of the water and the rower comes back up the slide slowly towards the catch. The catch is the transition point between moving backwards and forwards on the slide. When the rower catches the water with the blades anew she drives the seat forward by pushing against the foot stretchers.

with her seat”). Often she is explicitly reminded of this during her rowing practice. Sometimes it causes her to direct reflective attention towards her movements in an attempt to correct them.

You think: “I have to put pressure on the blades!” You do it and search for the feeling of making the boat flow and being able to forward the boat. This might give you a better catch of the water and this leads to a chain reaction of things. This might give you ten good strokes. But then your brain might suddenly think: “Hey! You are doing well. Remember! Keep on doing what you are doing!” And then your movements go awry, because it is like the thinking process is delayed in relation to the things you do with your body (Anne).

Leder notes that “...self-awareness can allow us to seek help and effect repair. However, it can also exacerbate problems, intensifying anxiety or a slump in performance” (Leder, 1990:85). In a like manner, Anne describes how her reminder to herself about putting more pressure on the blades might on the one hand influence her to row ten good strokes; but, on the other hand, Anne also indicates that such reflective self-awareness might distract her and distort her immediate coordination with the situation. Without ruling out the possibility that there might in some circumstances be benefits in influencing one’s performance through maxims and reflective self-awareness (Sutton, 2007), Anne’s description highlights the point that some processes of thought risk impeding performance, because they make her turn direct attention to basic aspects of the movement that should rather be kept subordinate to the rowing activity.

In some training situations, Anne seems to benefit from her superior upper-body strength. When rowing in the technically less demanding ergometer, Anne’s movement history not only enables her to sense and act from the point of view of the ergometer and, for instance, be involved in and guided by her split time displayed on the monitor, but it also enables her to compete with and sometimes outrow other national team rowers. Consequently, in the ergometer she meets only a few affordances, which encourage her towards changing her way of rowing and she seems to be kept on a local plateau in performance (Dreyfus & Dreyfus, 1999; Ericsson, 2007).

A feel for the good rhythm

In indoor training the rowers often train together with other national team rowers. All the rowers sit side by side, each of them in separate ergometers. They all follow the different paces of the predetermined training programme and in the course of this they prefer to share the same rhythm, although this is not always the case. As explained by Juliane, rowers can share the same pace all the while they perform different movements in between the two turning points in the stroke cycle.⁶ Consequently, the same pace measured on the monitor of the ergometer can be handled with different rhythms. Juliane explains that the correct way of rowing is to “reach the stroke gradually”, and that inexperienced rowers often rush this phase by “sliding with their seat”.

During one of the observed training sessions the joint rhythm is momentarily lost. Juliane is dissatisfied with the other rowers’ rhythm and breaks out of it. In the interview Juliane looked back on the situation and described her dissatisfaction:

I felt that they made a really really bad rhythm, and probably because I used to be the stroke, it was difficult for me to follow their bad rhythm, because I wasn’t sitting well in it [i.e., wasn’t being comfortable with rowing this way]. I thought that I would rather row on my own rhythm, which is good [...] Afterwards, the coach told me that my way of “sitting” in the rowing improved when I did my own rhythm. So, in that sense it is obviously bad to sit next to someone who has a bad rhythm (Juliane).

While Juliane chooses to follow her own rhythm, Anne keeps following the shared rhythm, which annoys Juliane. This indicates that Juliane experiences the rhythm differently to Anne. Hughson and Inglis (2002) describe what they call *the silky touch* among star players in football. This is a certain form of practical knowledge that allows the star player to make use of spaces in the game that cannot be seen by those lacking the star player’s feel for the game. Comparably, Juliane seems to have a practical knowledge and a finely tuned feel for what the good rhythm has to feel like within a given pace. This enables her to sense some irregularities in the rhythm of a given pace which are not perceived by Anne. Furthermore, her feel for the rhythm enables her to break loose from

6 The turning points in the stroke cycle are when the rowers transfer the backward movement into a forward movement and vice versa.

the rhythm of the group, find her own “good” rhythm, and improve her performance.

Kretchmar suggests that accomplished athletes are characterized by being able to “make claims on unfolding situations rather than being ‘claimed’ by them” (Kretchmar, 1982:11-12). This – he argues – has to do with accomplished athletes’ ability to keep an intentional “distance” from their activity, which means that the athletes cease to adhere immediately to the sporting context and are able to change the course of action.

Juliane seems to be able to keep an intentional distance from the rowing when she focuses on the rhythm, because her experience of the unfolding rhythm is accompanied and guided by her kinaesthetic memory of the good rhythm. Unlike Anne, Juliane is not inexorably drawn to following the rhythm of the training group. Instead, Juliane can be flexible and recreate the good rhythm of the given pace in spite of the distraction caused by the other rowers’ “bad” rhythm. This flexibility makes Juliane capable of maintaining a generally stable rhythm in her rowing performances.

Training while coupled together

Juliane’s finely tuned feel for the rhythm seems to benefit Anne’s learning process when they row together in the double scull and in two coupled rowing ergometers. In the latter situation two ergometers are placed in “slides”, which link the ergometers in continuation of each other. Rowing in coupled ergometers is a way of simulating the situation in the double scull when training indoors. This way the rowers can practise a joint rhythm without having to adjust to variables such as each other’s balance, waves, wind etc.⁷ When training this way, Juliane is “the stroke” and Anne is “the bow”.⁸ Thus Anne is placed in the front end of the boat, which enables her to see Juliane’s movements. As “the stroke”, Juliane sets the pace and the rhythm for Anne to follow.

Distortion

When the rowers row in the boat or the coupled ergometers, they impact the same object. Thus their handling of the boat/ergometer involves coordinating with the partner’s handling of the boat/ergometer. The boat

7 Also, this training situation, in contrast to rowing on water, allowed the principal researcher to be very close to the rowers during the observations.

8 The “bow” is the rower sitting opposite the stern.

or the coupled ergometers extend the rowers' bodies to engage each other in what can be termed a "mutual incorporation" (Leder, 1990; Fuchs & De Jaegher, 2009). Anne explains how rowing in the coupled ergometers differs from rowing side by side.

When rowing side by side, we can be back and forth in the stroke cycle at the same time, but during this movement I might slide with the seat, but still be there [having the legs fully compressed] at the same time as Juliane. This is not possible when rowing in slides, because if you don't make pressure at the same time, then you will feel that this brings about some kind of delay. In the slide it becomes easier for me to feel Juliane's pressure when rowing. This is a good exercise because it teaches me when to make the pressure during the stroke cycle and restricts me from sliding with my seat. If, contrary to Juliane, I try to slide with the seat, which I shouldn't, it will bring about a "tjuk-tjuk" in the stroke cycle (Anne).

The coupled ergometers entangle the rowers' movements and give rise to immediate experiences of good or bad rhythm. Occasionally, Anne's tendency to "slide with the seat" seems to trigger experiences of bad rhythm. During these moments the rowers' intertwined movements entail conflicting experiential qualities described by Anne as a "tjuk-tjuk". It is the feeling of movements that work against each other. The "tjuk-tjuk" feeling takes the place of the otherwise desired state of sensing and acting from the point of view of the coupled ergometers that is felt during a good rhythm. As such, feeling the "tjuk-tjuk" is a direct kinaesthetic reminder that immediately stimulates the rowers to re-establish the rhythm.

At first, Anne's tendency to slide with the seat seemed to limit her development, when she practiced in the ergometer on her own. Dreyfus and Dreyfus describe how one can move beyond a local plateau by reflecting about one's habitual but different behaviour and deliberately compensate by changing the behaviour. Moving beyond a local plateau can also happen when responding immediately to a novel situation and in interactions with others whose styles of behaviour differ from one's own (Dreyfus & Dreyfus, 2008). The latter seems to be the case when the rowers coordinate with each other in the coupled ergometers. The felt tension between the two rowers' styles of rowing constantly affords Anne the opportunity to adjust her way of rowing to Juliane's rhythm. Obviously, this kind of adjustment does not occur when she is training alone.

Anne submits herself to Juliane's rhythm

Anne feels that the “tjuk-tjuk” originates from her pushing against Juliane's good rhythm and is attributable to Anne's inexperienced and inept style of rowing. This might be further clarified by describing the power relations entailed in the coupled situation. When placing themselves in the coupled ergometers the rowers also place themselves in culturally formed “processes of normalization” (Barker-Ruchti et al., 2012), which affects what the rowers perceive as normal and how they make sense of their practice and relationship. As an example, these processes designate specific functions to the rowers. Traditionally, “the stroke” sitting in the tail end of the boat sets the pace and the rhythm for “the bow” to follow, partly because “the stroke” cannot see “the bow”. This means that Anne – as the bow – is conditioned to submitting and aligning herself to Juliane's rhythm.

Anne lacks the experience and expert power exemplified by Juliane. This inequality pushes Anne to admire, seek and submit to the accomplished behaviour exemplified by Juliane in order to be included in the field of expertise which she is not yet a part of (Wenger, 1998). Thus Juliane's performance sets the standard for Anne when they are rowing together, and Anne continually attempts to reach for the level of performance exemplified by Juliane. By continually being prompted to respond to Juliane's movements in a directly intercorporeal sense, a learning situation is created in which Anne's opportunities for sliding with the seat are inhibited and her opportunities for moving in a way that corresponds with Juliane's rhythm are facilitated. This shows that relations of power shape the way the rowers interact when rowing together and affect the ways they learn (Hodkinson, Biesta, & James, 2008).

Furthermore, Juliane's continual physical impacts seem to relieve Anne from consciously trying to suppress and control her tendency to “slide with the seat”, which otherwise seems necessary when Anne deals with this bad habit in the single ergometer. Instead of turning her attention directly towards her own movements, the kinaesthetic sensations in the coupled situation seem to train Anne to control her rowing in an atheoretical way (Dreyfus & Dreyfus, 2005) by being guided by what happens between her and Juliane. In matching moments Anne seems to catch glimpses of belonging to a good rhythm and experiencing what it feels like when the rowers kinaesthetically reverberate in each other's movements in a mutually complementary way. In other words, the assistance given to Anne in this situation is kept to a holistic format, which seems

to teach Anne to control her rowing by feeling the rhythm rather than by controlling the microstructure of her action (MacPherson & Collins, 2009).

Juliane learns to recreate her way of rowing

Juliane explains that she had to balance the boat for Anne and help Anne to feel at home in the boat the first times they trained on the water in the double scull. Gradually she has felt Anne's development in relation to her own rowing movement:

When I first felt that I could start putting full pressure on the blades, and start making a real rowing stroke. Well, then I realized the advancements. And in our recent trainings, when [a coach] corrected us, I started to row full seat and was able to work with my own things [technique] (Juliane).

Even though Juliane's movements seem to dominate when the rowers are coupled together, the quotation indicates that the coupled situation calls for the rowers to find a common ground. This means that Juliane's movements are also interwoven in, and affected and regulated by, Anne's movements. Juliane seems to use her impediment in reaching an optimal state as a measuring stick for grasping Anne's level. Furthermore, Juliane describes that she uses the coupled situation to "carry forward some sensations" and "impact the rhythm physically". This indicates that Juliane pursues the feel for the good rhythm not only through her own body but also through Anne's body (Leder, 1990; Fuchs & De Jaegher, 2009) and is able to use the felt intersubjective kinaesthetic qualities as a launch pad to influence the joint rhythm.

The difference between being coupled with Anne and, for instance, guiding her from the sidelines, seems to be that Juliane in the coupled situation becomes interwoven in Anne's struggles. Distortions that immediately manifest themselves to Anne also affect Juliane's perceptions and actions (Fuchs & De Jaegher, 2009). While being intentionally engaged in maintaining a good joint rhythm, the situation inherently requires that Juliane empathizes with Anne's situation and tailors her movements to Anne's needs (Downey, 2008a; 2008b). Consequently the situation also seems to train Juliane's ability to compensate and recreate her way of rowing while coupled with Anne. This indicates that perfecting Anne's rowing skills is not just a question of transmitting knowledge from Juliane to Anne. Rather, the process of coordination between the

two rowers is to be considered as a process of guided rediscovery for both rowers (Ingold, 2001; Downey 2005). Thus Anne comes to (re)discover the style of rowing as exemplified by Juliane, and Juliane is prompted to rediscover her expertise when tuning her rowing style to the needs of Anne.

Concluding remarks

When Anne starts learning the new skill of rowing, she can hardly be characterized as a blank slate. Anne's initial attempts to row are clearly marked by her movement history as a kayaker. Anne's prior expertise traps her on a local plateau in performance when rowing alone. When coupled to Juliane's experienced movements, Anne's skills seem to be carried forward, because Juliane's movements pervade Anne's actions and perceptions kinaesthetically. This way Anne is afforded certain opportunities to perceive and perform the rowing rhythm, and is provided with the scaffolding, i.e., Juliane's compensating movements, which enable her to make use of these affordances. Training this way does not teach Anne about the good joint rhythm through reflective analysis. Primarily Anne is taught how to remain perceptually engaged in the joint rhythm. Thus Anne is taught how to row from the perspective of feeling the joint rhythm.

Our study also suggests that a process of apprenticeship learning can be thought of as a process of embodied interaction, rather than a unidirectional transmission of skills from expert to apprentice. Thus the expert's movements are also affected by the rowers' processes of coordination and this might restrict the expert from performing at her highest level. However, being coupled with Anne enables Juliane to have a hands-on feel of Anne's skill level. This way Juliane learns how to compensate and scaffold Anne's performance in a way which is fitted to Anne's needs. In the short run this learning does not improve Juliane's individual rowing skills, but in the long run Juliane's abilities to compensate seem to play an important role in Anne's rapid development and enables the rowers to fulfil their overall goal by qualifying the boat for the Olympic Games. Ultimately this means that Juliane also gained from the apprenticeship.

In double sculls rowing, performances are measured on how the rowers perform as a unit and not as a sum of individual performances. Thus expertise is established in the intercorporeal coordination between the

rowers and in the way they are regulated and affected by each other. In this sense, Juliane's individual level of performance does not seem to have deteriorated because of the apprenticeship. Instead Anne's learning process has developed Juliane's flexibility and made her better at – what is most crucial for the rowers' performances – reinitiating and maintaining a good rhythm with Anne.

Generally our study suggests that we should broaden our perspective on apprenticeship learning and expertise in elite sport. We suggest that apprenticeship learning in certain cases, e.g. when the performers are kin-aesthetically coupled, should be regarded as an embodied and mutually affecting process in which all the participating athletes might expand their level of expertise.

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