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Operant Subjectivity
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Views about Knowledge Acquisition for Coaching Practice

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Abstract: This study explores coaches' subjective views about how they acquire knowledge for their coaching practice. A Q sample of 45 opinions about different sources for knowledge acquisition, and how such sources affect learning at personal, relational, and content knowledge levels, was presented to sport coaches. Forty-five coaches from 11 different sports on both elite and national medium levels were asked to consider and rank-order the statements through a Q sorting procedure. Following Centroid factor extraction and Varimax rotation, a three-factor solution was chosen. The factors reflected three points of view about sources of knowledge acquisition for coaching practice. Some implications for coaching practice are noted and discussed.

Keywords: coaching practice, coaching expertise, education, knowledge acquisition, sport

Introduction

The sport setting has mainly been viewed as an arena where athletes learn their sport and where coaches are considered to be crucial for cultivating and developing their athletes' potential (Cushion et al., 2010; Jones, 2006; Jowett, 2007; Jowett & Ntoumanis, 2004; Lyle & Cushion, 2010; Moen, 2014). Although there are immense difficulties in quantifying "performance", athletes' enhanced performances and successes in competitions are main factors in the evaluation of coaches (Courneya & Chelladurai, 1991; Riemer & Toon, 2001). Interestingly, recent research also emphasises that the sport setting is a place where coaches' learning takes place (Cushion, 2006). Thus, for coaches it is essential to effectively build and develop their coaching practice to be competitive with their athletes in their sports.

Learning is here defined as an "act or process by which behavioural change, knowledge, skills, and attitudes are acquired" (Jarvis, 2004, pp. 100-101). Therefore, learning can occur through several sources of knowledge, such as coaches' own experiences, their reflections and studies and/or instructions in more formal educational settings (Nelson, Cushion, & Portac, 2006). Earlier research shows that coaches learn from a number of sources and that learning from experience and engaging with other coaches are the dominant sources of knowledge acquisition

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(Cushion et al., 2010). This study aims to investigate what coaches believe are the most influential sources of knowledge and how these sources affect important coach competencies. Thus, the research question to be addressed in this study is, *What are the most influential sources of knowledge for coaches in their coaching practices, and do these sources of knowledge influence the coaches' personal, interpersonal and/or content knowledge learning?*

Theoretical Background

Developing a good coaching practice can occur through a variety of different sources of knowledge (Mallett, Trudel, Lyle & Rynne, 2009). Some studies have divided the framework of knowledge acquisition into three different sources: formal, non-formal and informal coach education (Cushion et al., 2010; Mallett et al., 2009). Formal coach education is defined as "institutionalised, chronologically graded and hierarchically structured educational system" (Coombs & Ahmed, 1974, p. 8). Academic education degrees and coaching education courses within the independent sports belong to the formal coaching education source, as they have a guided delivery (Mallett et al., 2009). The non-formal coaching education includes courses, seminars and conferences that do not occur at the formal institutional level. These may be short courses that focus on specific themes and areas of interest and are most often attended by experienced coaches in a continuum of professional development (Cushion et al., 2010). The third source is informal coaching education, which has been described as "the lifelong process by which every person acquires and accumulates knowledge, skills, attitudes and insights from daily experiences and exposure to the environment" (Coombs & Ahmed, 1974, p. 8). Examples of informal knowledge acquisition are experience as an athlete, mentoring, coaching experience and interactions with other coaches and athletes (Cushion et al., 2010). Previous research on knowledge acquisition and coaching education has found that coaches seek all the three sources of educational opportunities to learn more about the coaching role and its complexities (Cushion, Armour & Jones, 2003). There is also a view that to only acquire knowledge through one educational source is not sufficient to develop a good coaching practice (Mallett et al., 2009).

Coaches' Learning

A natural aim in all education is to achieve growth and learning based on different sources of knowledge. Especially in competitive sport, learning is an absolute necessity. However, there are significantly different ways of understanding learning and what effects it has in different educational situations (Hodkinson, Biesta & James, 2008). Research on coaching competencies has documented several key elements that are needed for a good coaching practice (Myers, Wolfe, Maier, Feltz & Reckase, 2006). First of all, sport-specific content knowledge has been found to be a central competency for coaches and should therefore be a natural learning outcome from different sources of knowledge (Kavussanu, Boardley, Jutkiewicz, Vincent & Ring, 2008). Content knowledge is knowledge of the sport-specific techniques, the fundamentals of sport exercise and how to transmit these into the coaching practice (Cassidy, Jones & Portac, 2016). Having the knowledge about the specific sporting techniques and the pedagogical skills to use them in an athletic learning environment are important for the coach to feel efficacious and to perform optimally in the coaching role (Chase, Feltz, Hayashi & Hepler, 2005; Siedentop, 2002). Second, it is well documented in sport science that interpersonal relationships are required to successfully develop athletes' potential (Jowett, 2008). Thus, competencies to build effective relationships are expected to be an outcome of different sources of knowledge. The coach needs to have an understanding of the

athletes' feelings and experiences, and therefore needs to have the knowledge to emphasise and accept this relational phenomenon (Moen & Sandstad, 2014; Rogers, 1959). Interestingly, the interpersonal behaviour of the coach has proven to have a significant impact on the athletes (Amorose & Anderson-Butcher, 2007). Third, the founder of humanistic psychology, Carl Rogers (1969), pointed to the importance of self-discovery and the necessity of it being self-acquired in learning situations. This personal learning is intrapersonal, in which the coach learns about himself or herself through knowledge acquisition. When personal learning is the aim in education, the aim is to help coaches internalise their specific coaching practice (Nelson, Cushion, Potrac & Groom, 2014). The knowledge that the coach acquires should become a part of the self that constantly evolves as the knowledge changes. Personal development is therefore expected as an effect from learning sources in coaching education. Thus, learning can occur as coaches develop their content knowledge, interpersonal knowledge and/or intrapersonal knowledge.

Research Methods and Design

The research question in this study invites an exploration of subjectivity among sport coaches regarding their views about how they acquire knowledge for their coaching practice, as well as how they think the different knowledge sources influence their personal, relational and/or content knowledge learning. Q methodology was chosen as the research method, and the study was conducted through a series of five steps: (1) defining the concourse, (2) developing the Q sample, (3) selecting the P sample, (4) Q sorting and (5) analysing and interpreting the data (Brown, 1993; Watts & Stenner, 2012).

Defining the Concourse

The concourse (Stephenson, 1986) was established through an analysis of relevant literature and theories within the field. A list of about 100 statements was compiled, which covered different possible viewpoints about the research issue. The statements were then systematically organised, analysed and presented as the concourse, that is, within the segment of the actual communication universe (Brown, 2002; Kvalsund, 1998). The concourse was reduced to a meaningful Q sample in order to create a balanced sample for stimulating the Q sorters to use the subjective statements (sample) to rank-order them *self-referentially* and draw a picture of their own self-conceived view about the research issue (McKeown & Thomas, 1988).

Developing the Q Sample

In the present study, two main themes (what Stephenson [1950] calls "effects") emerged in the concourse: *source of knowledge* and *learning*. Within the theme *source of knowledge*, three subthemes (what Stephenson [1950] calls "levels") seemed to be relevant: the formal sources of knowledge (formal coach education, university education, formal mentoring); the non-formal sources (observation of other coaches, sport seminars, dialogue with other coaches, written resources) and the informal sources (experience as an athlete, reflection upon own experiences, dialogue with athletes). Within the theme of *learning*, three other subthemes, or levels, seemed to be relevant: learning at a personal level, learning at a relational level and learning content knowledge relevant for one's own sport. In this study, it is important to investigate what type of knowledge source the coaches prefer and what they believe is the benefit from a particular knowledge source. As a result, the design for the statements was created as shown in Table 1.

Table 1: The Design of the Statements based on Coaching Style and Benefit

Effects	**Levels**		
Source of knowledge	a. Formal	b. Non-formal	c. Informal
Learning	d. Personal	e. Relational	f. Content

Each combination of independent effects and levels becomes a categorical cell. Based on this, one must look to the levels to see all possible combinations of cells, since they are the multiplication of levels by all three effects. Using the design in Table 1, nine combinations of statements are obtained, as shown in Table 2.

Table 2: The Combination of Levels in the Design

	Combination of levels								
Source of knowledge	a	a	a	b	b	b	c	c	c
Learning	d	e	f	d	e	f	d	e	f
Statement Number	1, 10, 19, 28, 37	2, 11, 20, 29, 38	3, 12, 21, 30, 39	4, 13, 22, 31, 40	5, 14, 23, 32, 41	6, 15, 24, 33, 42	7, 16, 25, 34, 43	8, 17, 26, 35, 44	9, 18, 27, 36, 45

In principle, there are 3x3 cells. Each cell consists of statements that are interrelated but with positive, negative and neutral views that are representing each cell. After studying the statements in the concourse and the different levels that emerged, the authors decided to use five statements from the concourse to represent each of the nine cells. The statements that most clearly represented the viewpoint in the different cells were picked for the Q sample, which resulted in 45 statements. To make it difficult for the sorter to see the structure in the sample, the first statements in each cell were allocated a serial numbering from 1 to 9, then the second statements were given the numbers from 10 to 18, then 19 to 27, then 28 to 36, and finally 37 to 45. The list of statements can be found in Appendix 1.

Selecting the P Sample

The researchers collected data from 45 Norwegian coaches who were practicing as coaches at various levels. One group of coaches was attending a coaching education program at the Norwegian University of Science and Technology (NTNU), one group was working at different sport gymnasiums for elite sports in Trondheim and one group was working at the club and district levels with athletes who were 15 and 16 years old. The coaches had backgrounds in 11 different sports, including biathlon, cross country skiing, triathlon, Nordic combined, tennis, handball, snowboard, ski orienteering, cycling, boxing and football. The average age of the 33 male coaches was 39 years old, and of the 12 female coaches, 37 years old. The overall average age was 38, with the oldest 54 being years old and the youngest being 24 years old. The sample group had practiced as coaches for 10 years on average. The educational background varied from high school level to postgraduate level, and 21 of the coaches reported having relevant

sport education in higher education. The level of completed coaching programs within the different governing bodies varied from level one to level four (Norwegian coaching education goes from level one, which is the starting point, to level four, which is the top level). Additionally, the study participants practiced as coaches for athletes at both the international top level and at the national medium level in their sports.

Q Sorting

The coaches were asked to take their time to read through all the statements in the Q sample while considering a specific condition of instruction: What knowledge source had influenced their coaching practice as they were practicing today, and how had this source influenced their personal, relational and/or content knowledge learning?

The coaches were asked to rank order the statements using a quasi-normal distribution grid ranging from +5 for "most strongly agree" to -5 for "most strongly disagree". Coaches were free to place an item anywhere within the distribution but forced to keep to the distribution grid in order to make all the necessary nuanced evaluations of the statements (Kvalsund, 1998).

Analysing and Interpreting the Data

After all of the data were collected, the researchers entered each Q sort into the computer program PQMethod (Schlmock, 2002), which is a dedicated statistical program tailored for Q studies (Allgood & Svennungsen, 2008; Rhoads, 2007). The program computed a 45 x 45 correlation matrix, which was then subjected to a centroid factor analysis with the default number of 7 for extraction of an unrotated factor matrix (Brown, 1980). Following Varimax rotation, it became clear that there was one strong factor and two other possible factors that had only one loading on each. According to Brown (1980), a good criterion for accepting a factor is a minimum of two sorts on each factor. However, since the authors were very interested in even small variations and nuances in the coaches' experiences, a three-factor solution was accepted, with both pure and mixed loadings on the second and third factors (see Appendix 2). Although the authors are aware that this process goes against the principle of producing "simple structure", the addition of mixed sorts in the two smaller factors enabled the discovery of nuances among the factors that could be further investigated. The correlation between these three factors is in the range from low to medium, as shown in Table 3.

Table 3*: *Correlations among Factors

Factors	A	B	C
A	1.00	0.17	0.53
B	0.17	1.00	0.30
C	0.53	0.30	1.00

Factor A consisted of 34 pure sorts and 8 mixed cases; Factors B and C consisted of 3 and 7 sorts, respectively, with 2 and 6 sorts being mixed expressions with Factor A. Thus, coaches who sorted in approximately similar ways were included (McKeown & Thomas, 1988) in the Factor B and C solutions. Although this mixed-sorts solution is arguably less than ideal, it allowed the authors to delve into the coaches' subjectivity from three different perspectives. It is important to use considered judgments to guide the decision making about how many factors to be extracted, not inflexible rules to be obeyed (Brown, 1980; Watts & Stenner, 2012). Therefore, the authors decided that the three-factor solution would enable them to explore nuanced subjective viewpoints

regarding the research question. The factors, then, represented natural categories of subjectivity that could be discovered by the researchers (Brown, 2002).

Results

The remainder of this article focuses on an analysis and discussion of these three factors. The statements on the extreme side with rank scores of +5, +4, -4 and –5 reflect the intense feelings and attitudes of each respondent and characterise the factor, so analysis is mainly focused on the interpretation of those statements (Brown, 1980, pp. 23-24).

Factor A: Informal Sources of Knowledge Affect Content Knowledge

The most extreme statements that represent Factor A on the positive side (+5 and +4) emphasise the importance of experiential learning through reflection (7, 16, 18) and dialogue with other coaches and their own athletes (6, 9). Thus, the coaches loading on Factor A mainly emphasise informal sources of knowledge. These sources of knowledge are supposed to affect content knowledge (6, 9, 18) and personal learning (7, 16). The most extreme statements on the negative side (-5, -4) also emphasise the importance of informal sources of knowledge in influencing the content knowledge of their sports (36, 42, 45), relational learning (44) and personal learning (34). These characteristics are clearly separate from the other two factors as evidenced by the distinguishing statements. The statements on both sides of the scoreboard on the next level (+3 and -3) support and strengthen this view (see also Appendix 1).

Table 5*: *The High and Low Scores for the Statements Representing Factor A

Number	Statement	Strength
7	My personal development is a result of reflecting over my experiences.	+5
6	Through conversations with other coaches I have developed a greater understanding of my sport.	+5
9	My understanding of my coaching practice has definitely developed through communicating with the athletes.	+4
18*	My own experience as an athlete is the most important source of my knowledge of my sport.	+4 0 0
16	I have discovered new sides of myself through trial and error, and reflection.	+4
36	*Systematic reflection on my own experience as a coach has little influence on my coaching practice.*	*-4*
34	*Experience is irrelevant for my personal development.*	*-4*
44*	*Conversations with my athletes have not affected my communication in a positive direction.*	*-4 -1 -1*
45*	*My knowledge of my sport has been developed independently of reflection over my own experience.*	*-5 +4 +2*
42*	*Other coaches have not influenced my knowledge of my sport.*	*-5 0 0*

Note: Including mixed cases, 42 cases loaded on Factor A.
*Distinguishing statements for this factor and values for all three factors are shown in these cases in the factor order A, B, C.

Factor B: Dialogue and Formal Studies Affect Content and Personal Learning

The most extreme statements that represent Factor B on the positive side (+5 and +4) emphasise the importance of dialogue with other coaches (6) and communication with

the athletes (9). Mere observation (32) is not enough, and reflection (26, 45) is not valued. Thus, Factor B positively emphasises non-formal sources of knowledge and negatively emphasises informal ones. These sources of knowledge are supposed to affect content knowledge learning (6, 9, 45) and relational learning (26, 32). The most extreme statements on the negative side (-5 and -4) emphasise informal sources of knowledge (16, 34, 36) to describe that these do not affect Factor B's personal and relational learning. They also emphasise non-formal (40) and formal sources of knowledge (28). Interestingly, at the next level on both sides of the scoreboard (+3 and -3), 5 out of the 8 statements emphasise how formal sources of knowledge influence their learning (2, 3, 10, 37, 39). Thus, formal sources of knowledge are also emphasised among the coaches loading on Factor B.

Table 6: The High and Low Scores for the Statements Representing Factor B

Number	Statement	Strength
6	Through conversations with other coaches I have developed a greater understanding of my sport.	+5
32*	My observing other coaches hardly influences my empathy.	+5 -2 0
9	My understanding of my coaching practice has definitely developed through communicating with the athletes.	+4
26*	I seldom think about how reflection might have developed my relational qualities.	+4 -2 -2
45	My knowledge of my sport has been developed independently of reflection over my own experience.	+4
28	*University studies have absolutely not developed me on the personal level.*	*-4*
40*	*Books have definitely helped me to understand new sides of myself.*	*-4 +2 +2*
36	*Systematic reflection on my own experience as a coach has little influence on my coaching practice.*	*-4*
16*	*I have discovered new sides of myself through trial and error, and reflection.*	*-5 +4 +3*
34	*Experience is irrelevant for my personal development.*	*-5*

Note: Including mixed cases, 3 cases loaded on Factor B.
*Distinguishing statements for this factor and values for all three factors are shown in these cases in the factor order B, A, C.

Factor C: Formal Education and Personal Experience Affect Learning in General

The most extreme statements that represent Factor C on the positive side (+5 and +4) emphasise the importance of formal sources of knowledge such as university studies (1, 3, 11, 12) to affect personal, relational and content learning. This view is also emphasised in statements (20, 30) that represent Factor C on the extreme negative side (-5 and -4). However, the main affect is on both relational and content knowledge learning (17, 11, 35, 20, 3, 12, 30). The importance of experience (informal sources of knowledge) is also emphasised (25, 34, 35). Thus, the importance of formal education is emphasised in Factor C. The statements on both sides of the scoreboard on the next level (+3 and -3) strengthen this view (see also Appendix 1).

Table 7*: *The High and Low Scores for the Statements Representing Factor C

Number	Statement	Strength
1*	My studies at the university have definitely helped me to develop on a personal level.	+5 +1 +1
17	I have developed through critical reflection on how I work with others.	+5
3	Formal education has definitely helped to develop my work as a coach.	+4
11*	I have learned to meet others in a good manner through studying at the university.	+4 +1 -2
12	My applied understanding of the practice of coaching has evolved through lectures at the university.	+4
25	*I have no opinion on whether or not my experiences have developed me as a person.*	*-4*
35	*Experience has not influenced my behaviour toward others.*	*-4*
20*	*I have no idea if studies at the university have had an impact on my interpersonal qualities or not.*	*-4 0 +1*
30	*My job as a coach has not particularly been influenced by studies at the university.*	*-5*
34	*Experience is irrelevant for my personal development.*	*-5*

Note: Including mixed cases, 7 cases loaded on Factor C.
*Distinguishing statements for this factor and values for all three factors are shown in these cases in the factor order C, A, B.

Discussion

The coaches in this study were instructed to sort statements about sources of knowledge relevant for their coaching practice, considering how these sources affect their personal, interpersonal and content knowledge learning. The results in this study show there is one main factor (Factor A), on which 42 of the 45 coaches loaded, when mixed sorts are included (see Appendix 2). Thus, virtually every coach in this study is associated with Factor A. The results also show that there are two other significant factors, B and C, on which 3 and 7 coaches loaded, respectively, when mixed sorts are included.

Informal Sources of Knowledge Affect Content and Personal Learning

The viewpoints representing Factor A emphasise experience, both one's own and others' experience, which are explored by being in dialogue with other coaches, as an important source of knowledge acquisition. Experiential learning is grounded in the view that experience is the foundation for learning and development and that one's own experience is the basis for developing theories (Rogers, 1950) about how things are related in particular cases. Theories developed based on one's own experience are then subject to testing in new situations that either strengthen or weaken the developed theories. According to the American psychologist David Kolb, who has an experiential view on learning (1984, p. 41), "… learning is the process whereby knowledge is created through the transformation of experience". As for the coaches loading on Factor A in this study, learning results from the combination of grasping experience and transforming it (Kolb, 1984). One's own experience and/or the experience of other coaches are reflected upon, leading to sport-specific content knowledge learning and personal learning. This is rather surprising, since content knowledge is the typical effect formal learning is supposed to stimulate. However, the kind of informal learning that

the coaches loading on Factor A prefer is in contrast to formal education, in which a theory explains how things are related as the beginning point in learning. Interestingly, relational learning is not emphasised in Factor A. This is rather surprising, as relational knowledge has been found to be a key factor for coaches (Jowett, 2008).

Dialogue and Formal Studies Affect Content and Personal Learning

The coaches loading on Factor B seem to believe that dialogue (informal) with both other coaches and athletes is a central source of knowledge for seeking, building and developing their coaching practice. This relational learning viewpoint shares important similarities with Factor A, as both athletes and coaches are considered to hold valuable experience about their sports. Thus, experiential learning seems to be central also in Factor B, coaches valuing both their own experience and others' experiences as shared in relation. Interestingly, content knowledge learning and personal learning are supposed to be the effects of this knowledge source. Formal sources of knowledge, such as university studies, are also emphasised among the coaches loading on Factor B, and these are seen as affecting both personal, relational and content knowledge learning.

Formal Education and Personal Experience Affect Learning in General

The viewpoints representing Factor C emphasise formal education, such as university studies, combined with personal experience as the two main sources of knowledge. A possible interpretation of this viewpoint is that the coaches loading on Factor C are academically oriented in their coaching practice, and their work is based on the theoretical ideas they have learned through formal sources of knowledge. Interestingly, 5 out of the 6 coaches that positively load on Factor C have completed higher formal education (BA, MA, PhD). This seems to be in contrast with Factor A, which has a more experiential orientation in the learning process, even though these coaches have also completed higher formal education in general. It seems the difference between the two factors is a matter of emphasis, which isn't surprising, as their correlation is 0.53. Experience is also emphasised in Factor C, first of all as affecting personal and relational learning. A natural understanding might be that experience is necessary to test formal hypotheses about how things act together. Thus, academically acquired knowledge and experience are related to building and developing the coaches' coaching practice.

Conclusion

Overall, the majority of the coaches in this study seem to emphasise that the coaching role is a kind of professional practice that needs a practical approach to developing experience, and experience is essential for building the knowledge necessary to develop a good coaching practice. The coaches' learning preferences share important similarities with a qualitative case study, in which studying a phenomenon and grasping the experience of others, followed by reflection and interpretation, are central to understanding the phenomenon. This view in coaching is shared by recent research within sport science, which claims that a "sharpshooting" approach is necessary to understand the unique process of learning and development in depth (Mujika, 2015). "Sharpshooting" is used here as a metaphor about putting more time into aiming and being more effective in hitting the targets. Thus, it is essential for coaches to learn how to train their athletes to be smart and to learn that experience is essential.

The medium correlation (0.53) between Factors A and C shows that although the participants associated with the factors have different views about the current issue, they also have much in common. One possible interpretation might be the coaches believe that formal sources of knowledge are needed in order to draw qualitative

learning out of their experiences. Thus, formal sources of knowledge might represent a kind of qualitative standard against which coaches can test their reflections, so their reflections are of high quality and effective when it comes to learning.

The data from this study do not allow one to draw conclusions regarding the causal relation between a coach's knowledge source and possible effects on personal, relational and/or content knowledge learning. However, the qualitative data in this study and the interpretation of the results should be investigated and explored in future research, using both qualitative and quantitative research designs.

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Appendix 1: Q Sample with Statement Loadings on Each Factor

	Factors		
Statements	***A***	***B***	***C***
1. My studies at the university have definitely helped me to develop on a personal level.	+2	+1	+5
2. My empathic abilities have developed through lectures at the university.	-1	+3	+3
3. Formal education has definitely helped to develop my work as a coach.	+2	+3	+4
4. Through conversations with other coaches I have learned to understand myself better.	+3	0	+1
5. My ability to communicate well with others has evolved through active use of the Internet.	0	+2	0
6. Through conversations with other coaches I have developed a greater understanding of my sport.	+5	+5	+3
7. My personal development is a result of reflecting over my experiences.	+5	-3	+3
8. My empathy has developed through an experimental approach.	+2	+2	+1
9. My understanding of my coaching practice has definitely developed through communicating with the athletes.	+4	+4	+1
10. I have developed a greater understanding of myself through lectures at the university.	+1	+3	+2
11. I have learned to meet others in a good manner through studying at the university.	+1	-2	+4
12. My applied understanding of the practice of coaching has evolved through lectures at the university.	0	+2	+4
13. I have definitely developed my understanding of myself through being guided by a mentor.	+2	-1	0
14. I have gained a greater understanding of how I influence others after participating in seminars sponsored by my sport.	+3	+2	+1
15. My understanding of my sport has evolved through communicating with my athletes.	+3	+3	+2
16. I have discovered new sides of myself through trial and error, and reflection.	+4	-5	+3
17. I have developed through critical reflection on how I work with others.	+3	+1	+5
18. My own experience as an athlete is my most important knowledge source about my sport.	+4	0	0
19. I have no opinion about to what extent studies at the	+1	0	-3

	Factors		
Statements	***A***	***B***	***C***
university have helped me develop myself on a personal level.			
20. I have no idea if studies at the university have had an impact on my interpersonal qualities or not.	0	+1	-4
21. I have no opinion about whether or not my formal education has had an impact on my understanding of my sport.	0	0	-3
22. I am indifferent to whether or not non-formal settings have developed me personally.	-1	+1	-3
23. I have no opinion about whether or not seminars have developed my empathy.	0	-1	0
24. I have no opinion on whether or not my understanding of my sport is influenced by communication with other coaches.	-2	-1	-2
25. I have no opinion on whether or not my experiences have developed me as a person.	-2	0	-4
26. I seldom think about how reflection might have developed my relational qualities.	-2	+4	-2
27. I have no opinion on whether or not my experiences have developed my understanding of my sport.	-3	-2	-3
28. University studies have absolutely not developed me on the personal level.	-1	-4	-2
29. At the university I have not learned how to influence others.	-1	-2	-1
30. My job as a coach has not particularly been influenced by studies at the university.	+1	-2	-5
31. I experience no benefit from observing others in order to understand myself.	-2	0	-2
32. My observing other coaches hardly influences my empathy.	-2	+5	0
33. My athletes have not influenced my understanding of my sport.	-3	-1	-1
34. Experience is irrelevant for my personal development.	-4	-5	-5
35. Experience has not influenced my behaviour toward others.	-3	-3	-4
36. Systematic reflection on my own experience as a coach has little influence on my coaching practice.	-4	-4	-2
37. The way I see myself has not developed through studies at the university.	0	-3	-1
38. My ability to understand others has not been influenced through studies at the university.	+1	+2	0
39. My understanding of my sport has definitely not been influenced by formal studies.	0	-3	+2
40. Books have definitely helped me to understand new sides of myself.	+2	-4	+2
41. My understanding of other people has not evolved through books that I have read.	-1	-2	+1
42. Other coaches have not influenced my knowledge of my	-5	0	0

Statements	***Factors***		
	A	***B***	***C***
sport.			
43. Reflections about my experiences have hardly helped me to understand myself better.	-3	+1	-1
44. Conversations with my athletes have not affected my communication in a positive direction.	-4	-1	-1
45. My knowledge of my sport has been developed independently of reflection over my own experience.	-5	+4	+2

* Translated from Norwegian to English by the author

Appendix 2: Varimax Rotated Factor Loadings

Q Sort	Factor A	Factor B	Factor C
1.	**0.6621X**	0.3888	0.2242
2.	0.0620	**0.5048X**	0.0654
3.	**0.6426X**	0.3887	0.3332
4.	**0.8006X**	0.1301	0.0916
5.	**0.7661X**	0.2297	0.2804
6.	**0.6448X**	-0.0672	0.0882
7.	**0.9297X**	0.0276	0.0446
8.	**0.6443X**	0.0458	0.2336
9.	*0.5227X*	*0.5043X*	0.0662
10.	**0.8089X**	0.0503	0.0317
11.	**0.5589X**	0.2959	0.2030
12.	0.0033	0.0021	-0.0801
13.	**0.7442X**	0.2151	0.0129
14.	**0.8191X**	0.1586	-0.0129
15.	**0.7250X**	-0.1406	0.2357
16.	**0.9011X**	0.0974	0.0731
17.	**0.6771X**	0.1748	0.2618
18.	**0.8067X**	0.1019	0.1923
19.	**0.7895X**	0.0452	0.3498
20.	*0.8018X*	-0.0065	*0.3999X*
21.	**0.7565X**	0.0780	0.1880
22.	**0.6700X**	0.0712	0.3404
23.	*0.4879X*	0.1690	*0.4412X*
24.	0.3651	0.1780	**0.6464X**
25.	**0.6802X**	0.1855	0.1616
26.	**0.8189X**	0.2284	0.0715
27.	*0.4851X*	0.2522	*0.4646X*
28.	**0.8602X**	-0.0068	0.2263
29.	*0.6639X*	0.3011	*0.4002X*
30.	*0.5971X*	*0.4444X*	0.2316
31.	**0.8271X**	0.1226	0.0742
32.	**06976X**	0.2113	0.1486
33.	**0.8224X**	0.1781	0.3176
34.	**0.6993X**	0.3557	0.1017

Q Sort	Factor A	Factor B	Factor C
35.	**0.7828X**	0.1757	0.2498
36.	**0.4805X**	0.2402	0.1986
37.	*0.5725X*	0.3517	*0.5251X*
38.	**0.7860X**	0.1464	0.2693
39.	**0.7762X**	0.1742	0.0960
40.	**0.8029X**	0.1150	0.3492
41.	**0.7943X**	0.2770	0.2346
42.	*0.6461X*	0.1105	*-0.4117X*
43.	**07697X**	0.2495	0.2527
44.	**0.7887X**	0.1544	0.0452
45.	**0.9007X**	0.0859	0.0396
Pure cases	34	1	1
Pure and mixed cases	42	3	7

Note: Factor scores that contribute to a factor are marked with an X ($p < .01$); pure cases are in bold, and mixed cases in italics.