

Coaches' Perceptions of how Coaching Behavior affects Athletes: An Analysis of their Position on Basic Assumptions in the Coaching Role

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Abstract. This study explores coaches' beliefs about what they think their athletes expect from them as coaches in sport. A sample of 36 different statements representing different opinions about coach behaviours and how coach behavior affects athletes' motivation, performance, focus, and emotions, was presented to 23 Norwegian coaches working in high schools specialized for elite sports. The participants were coaches in various sport disciplines and were asked to consider and rank-order the statements by using a Q sorting procedure. The authors discuss their analysis from a Q methodical factor analysis. In general, the coaches share some common viewpoints that are represented in two different factors (consensus). Each factor represents congruence views about expectations in the role as a coach in sport. The dominant view (factor A) is that coaches believe that their athletes expect involvement leadership, whereas servant leadership was dominant in factor B; a view that only a few of the coaches shared.

Keywords: coaching styles, coaching behavior, athletes, sport.

1. Introduction

The question as to what coaching behaviour is constructive in order to develop the athlete in sport has occupied researchers and practitioners for several decades, and the influence of the coach on the athletes is well documented (Abraham, Collins, & Martindale, 2006; Blom, Watson II, & Spadaro, 2010; Côté & Gilbert, 2009; Myers, Chase, Beauchamp & Jackson, 2010). When a coach emphasizes training and instruction, and gives positive feedback that recognizes and rewards good performance, athletes are more satisfied with their leadership behaviour (Chelladurai, 2007). Similarly, a study performed by Moen, Høigaard, and Peters (2014) found that athletes who were most satisfied with their performance

progress evaluated their coaches' leadership behavior in accordance with the guidelines described by Chelladurai (2007) above. From a coaching perspective athletes' performance, behaviour, motivation, and emotional states within sport is affected of coaches' behaviour (Jowett & Cockerill, 2002; Lyle, 1999; Mageau & Vallerand, 2003; Strachen, Cote & Deakin, 2011). For an athlete to reach their potential the amount of time spent on deliberate practice is of vital importance (Ericsson, 2009) as well as the ability to manage or carry out the extensive amount of practice motivation is necessary (Deci & Ryan, 2002; Ericsson, Krampe, & Tesch-Römer, 1993). Lyle (2002) suggests that performance coaching embrace an attempt to control contributory variables and this perspective the coaches' role is to adapt high quality exercise, based on the athlete's physically, mentally and stage of social development. The ability to create a positive coaching process demands knowledge about the sport (e.g. technical, tactical, physiological, and psychological), the learning process, and the athletes' abilities and potential (Jones, 2006). Furthermore, good communications skills and the ability to establish a 'productive' coach-athlete relationship are also of vital importance (Jowett & Cockerill, 2003). Moen (2012) claims that the ability to ask open-ended questions and listen to the athlete is essential in the coaching process in order to optimally stimulate an athlete's intrinsic motivation. This can be considered as the origin of an optimal athlete-coach relationship based on mutuality (Jowett & Meek, 2000; Olympiou, Jowett, & Duda, 2008).

Lyle (2002) argues that it is not the individual coach, but the coaching process that is unique, and that the coaching role is determined by the nature of the coaching process, which takes place in a personal and social space. Furthermore, the values, idiosyncrasies and personal qualities of the coach are reflected in the interpersonal behaviour and the engagement in the coaching process. This is in line with Horn's (2008) working model of coaching effectiveness, which emphasizes that coaches' expectancies, values, beliefs, and goals influence a coach's behaviour. Previous research on teachers' beliefs has shown that beliefs may influence their perceptions and pedagogy in action (Nespor, 1987; Rokeach, 1976). Rokeach (1976) claims that all beliefs are potential predictors to action, and that both action and beliefs have an influence on one another (Haney, Lumpe, Czerniak, & Engan, 2002). Both teaching and coaching behaviour reflect values, which may be considered as means to evaluate the experience. Personal value judgements about what is appropriate, good, bad, and worthy coaching behaviours affect the coaching process and reflect core elements in a coaching philosophy (Lyle, 1999; 2002; Wilcox & Trudel, 1998). Thus, an examination of beliefs about coaching behaviours delve into the heart of understanding coaches actions and may contribute to better grasp the coaching practice (Cassidy, Jones, & Potrac, 2009).

Taken together, a coach's main aim is to stimulate the athlete to develop his or her talent and capabilities by affecting the variables that have an impact on

performance (Jowett & Poczwardowski, 2007). Coaches' beliefs and values precursor practice and according to Cassidy et al., (2009), it is essential to know because it may contribute to explain why coaches do as they do.

In the present study we focus on understanding coaches' perception of how their behavior effect an athlete. More specifically we want to explore the coaches' opinion on how and perhaps which coaching behavior affects the athlete's motivation, emotion, performance, and focus. We are particularly interested in identifying coaches whom express similar subjective views in order to unveil patterns among the participants. In the present work the Q methodology as a tool for studying the coaches' beliefs was used. Even though this research strategy has been applied studying teacher beliefs (Lim, 2009; Thorsen, 2009; Øverland, Thorsen, & Størkesen, 2012) for at least two decades, only few study in sports science have utilized this approach (Moen, 2012; Moen & Garland, 2012; Moen & Kvalsund, 2014; Moen & Kvalsund, 2013; Moen & Verburg, 2012). Thus, a second aim was to clarify if Q methodology is useful for studying coaches beliefs related to their actions as coaches.

2. Method

A Q methodology was chosen because this methodology in general investigates subjectivity related to a defined topic (Brown, 1980). Subjectivity in all forms, including beliefs, views, experiences and opinions, are investigated in Q methodology (Brown, 1996). The methodological approach is completed through five tasks: 1) selecting participants, 2) defining a concourse, 3) developing a Q sample, 4) completing a q sorting, and 5) completing data analysis (Brown, 1996; Moen & Garland, 2012; Watts & Stenner, 2012).

2.1 Participants

The data in this study was collected from 23 Norwegian coaches (mean 46 yrs., range 26 - 64 yrs.). Their average education was 4 years at the University level with an average of 19 years practicing as a coach. The coaches were recruited from one high school specialized for various sport disciplines (e.g. cross country skiing, biathlon, track and field, football, volleyball, and handball). This particular high school was selected because of its long experience with developing youth athletes into top international athletes. The coaches work with athletes ranging from 16 to 19 years old with performance levels varying from national top level to national top regional level.

2.2 The Concourse

Based on literature, theories, and research within the coaching field in sport (Chelladurai, 2007; Côté & Gilbert, 2009; Jowett & Cockerill, 2002) we developed a concourse that consisted of a list of about 80 statements that covered different

beliefs about the current research question (Stephenson, 1986). The statements were written from an athlete's point of view: "My coach does not have to be open for questions." The concourse was then reduced into a meaningful Q sample in order to create a balanced sample for stimulating the Q-sorters (coaches) to use the subjective statements (sample) to rank-order them self-referentially and draw a picture of their own self-conceived view on the topic (McKeown & Thomas, 1988).

2.3 The Q sample

In the present study, two main themes (what Stephenson, 1950, calls effects) emerged in the concourse, *coach behaviour* and *effect*. Within the theme *coach behaviour* three sub-themes (what Stephenson, 1950 calls levels) seemed to be relevant: the coach's decision making style, the coach's motivational tendencies, and the coach's instructional behaviour (see Table 1). Within the theme *effect* four subthemes emerged: the athlete's motivations, focus, performance and emotions (Table 1).

Table 1

The design of the statements based on coaching behaviour and effect

Levels				
Coaching behaviour	a. coach's decision making style	b. coach's motivational tendencies	c. coach's instructional behavior	
Effect	d. athlete's motivation	e. athlete's performance	f. athlete's focus	g. athlete's emotions

The next step is to combine each of the three sub themes of coach behavior with each possible effect (Moen & Garland, 2012). Each possible combination becomes a categorical cell and it results in 3 x 4 cells (coach behavior x effects), as shown in Table 2.

Table 2

The combination of levels in the design

	Combination of levels											
Coaching behaviour	a	a	a	a	b	b	b	b	c	c	c	c
Effect	d	e	f	g	d	e	f	g	d	e	f	g
Statement No	1, 13, 25	2, 14, 26	3, 15, 27	4, 16, 28	5, 17, 29	6, 18, 30	7, 19, 31	8, 20, 32	9, 21, 33	10, 22, 34	11, 23, 35	12, 24, 36

The coach is however free to place each statement from the Q sample anywhere within the distribution, but the participant is forced to keep to the distribution form in order to make all the necessary nuanced evaluations of the 36 different statements (Kvalsund, 1998). The statements that are placed on both extreme ends of the scoreboard, ± 5 and ± 4 , are normally the statements that the participants have a strong connection with. Statements placed in the middle of the scoreboard are normally statements they have a more neutral connection with (Moen & Garland, 2012).

2.5 Q factor analysis

After the all the scoreboards from the coaches who participated in the investigation were collected, each Q sort (each coach's score on the different statements in the Q sample that is placed on the scoreboard) is entered into a program that is tailored for Q methodology called PQMethod (Schmolck, 2002). PQMethod uses factor analysis to analyse congruent scores from different coaches into factors (Allgood & Svenningsen, 2008; McKeown & Thomas, 1988; Moen & Garland, 2012; Rhoads, 2007). The aim is not to generalize the findings, but to find and qualitatively explore the viewpoints related to the different factors that emerge from the factor analysis. Thus, it must not be mistaken by the quantitative factor analysis (Brown, 1980). For any n Q sorts, the correlations from the Centroid factor analysis produce a matrix of 23×23 cells ($n \times n$). A high correlation coefficient indicates that two Q sorts (two scoreboards from two coaches) are sorted more or less the same way. The next step is to use a Varimax factor analysis to analyse the correlation matrix in order to find possible factors across the Q sorts. Different numbers of factors were tested for extraction, but the initial factor analysis showed that two main factors emerged: one factor had an eigenvalue (EV) of 9.6 counting for 42 % of the variance, whereas the other extracted factor had an EV of 1.54, counting for 7 % of the variance. The most influential factor(s) is the one with the highest EV, and EV is used to decide how many factors that are going to be extracted in the analysis. If a factor has an EV higher than 1 that factor is defined as a significant factor (Brown, 1980; Kvalsund, 1998).

After experimenting with various alternatives by Varimax rotation of factors, the authors decided to consider a hand rotation of factors based upon an unrotated two-factor solution from the Centroid factor analysis. The main argument for using this strategy was that the initial analysis revealed a high correlation between the factors from the Varimax rotation. Factors that are highly correlated indicate that there is probably only one main factor with which virtually all participants are associated. After studying the statements that represented the different factors, a two-factor solution was chosen. From using the unrotated

factors as the final solution the overarching consensus of the factors reveals, since the Varimax rotation is spreading the consensus across the rotated factors, which causes them to be highly correlated.

3. Results

The two factors that were discovered in this study are the two categories of beliefs related to the research question among the coaches who participated in this study (Brown, 2002). Thus, the emerging factors are created and influenced by the coaches who load on this particular factor. Q methodology uses an estimate developed by Brown (1980) to decide how high a factor loading needs to be to contribute to a factor or not (Pett, Lackey, & Sullivan, 2003, p. 208). A factor loading on a minimum of .41 was estimated in this study to decide if a Q sort (a coach's individual scoreboard) contributed to a factor (Brown, 1980; Kvalsund, 1998). The factor matrix in Table 3 shows that factor A has 16 pure cases (sorts that load only on one factor) and 21 loadings when mixed cases are included. Factor B has 2 pure cases and 7 cases when mixed cases are included.

Table 3

The Matrix of Rotated Factors and their Loadings

Q sort	Factor A	Factor B
1	0.64X	0.00
2	0.50X	0.06
3	0.69X	-0.28
4	0.84X	0.04
5	0.36	0.44X
6	0.81X	-0.14
7	0.64X	-0.09
8	0.55X	-0.35
9	0.79X	-0.07
10	0.47X	0.26
11	0.69X	-0.32
12	0.30	-0.46X
13	0.55X	-0.11
14	0.72X	-0.51X
15	0.72X	-0.51X
16	0.74X	-0.44X

17	0.64X	-0.22
18	0.50X	0.23
19	0.65X	-0.39
20	<i>0.41X</i>	-0.50X
21	<i>0.53X</i>	-0.61X
22	0.64X	0.02
23	0.42X	-0.02
Pure cases	16	2
Mixed cases	5	5
% variance explained	38	10

Note: X= significant factor loading. Factor loadings with **bold faces** are pure cases loading on a factor, and loadings with *italic faces* are mixed cases loading on more than one factor.

As seen in Table 3 all sorts that significantly load on factor A are positive, while only one of the sorts that load on factor B is positive. Six of the significant loadings on factor B are negative. The analysis found a negative significant correlation between factors A and B (-.65).

The statements on both extreme ends of the scoreboard, ± 5 and ± 4 , are the statements that involves the most reflected beliefs among the coaches. Therefore, our analysis in this study focuses on the statements on both extreme ends of the scoreboard (Brown, 1980). Based on characteristic statement, distinguishing statement and consensus statement we labelled factor A: Involvement leadership and factor, B: Servant leadership.

3.1 Factor A: Involvement leadership

The most extreme statements loading on factor A on the positive side (+5 and +4) emphasize the importance of involvement of athletes to affect their motivation, emotions (such as curiosity and interest), and performance (statement number 1, 2 and 4). The most extreme statements on the negative side (-5 and -4) also highlight the importance of involvement to affect an athlete's emotions (such as commitment), and focus (statement number 16 and 27) (see Table 5). Finally, feedback and social support are also emphasized in order to affect performance (statement number 18). A democratic coaching behavior is when athletes are invited to participate in coaching decisions together with the coach (Chelladurai, 1989). The involvement leadership factor represents the views of 16 of the participant coaches. A comparison with the respondents who not loaded on factor A and the general variables on each scoreboard that documented the

coaches coaching experience and education level, shows no differences in coaching experience or education level between the two groups of coaches. The strong loading on factor A seems to reflect that coaches consider stimulating athlete involvement as a core element in their coaching practice. Following Chelladurai's (1989, 1990) description of democratic behavior, the loading on factor A seem to be associated with this dimension affording participation in athletes' decisions in their sport (item 16). However, the views in factor A also represent a fundamental pedagogical perspective emphasized that athlete involvement are a major source influencing athlete motivation, curiosity and performance.

Vygotsky (1978) suggest that all learning and development is based on social activity and interaction with tools. Coaching effort directed towards stimulating athlete involvement can be considered as measure that gives opportunities to reciprocate reflection and enable the coach and the athlete to think and understand each other. Mediation is a key concept in Vygotsky's theory, and the role of the mediator (coach) is to clarify what kind of involvement is effective or not in order to enhance performance of the individual (Kozulin, 2003). According to Kozulin (2003) human meditation seems to be too numerous and context dependent to allow a simple classification, but belongs to interactive activity. The participants loading on factor A is a strong disagreement suggesting that neither feedback nor social support are crucial for their performance in sport indicating that this coaching behavior is a kind of mediating involvement that enhancing performance (statement 18).

Table 4

Distinguished Statements Loading on Factor A; Involvement leadership

Number	Statement	Strength
1	My motivation for training increases when my coach involves me.	+5
4	I become curious and interested if my coach involves me in matters concerning my training.	+4
2	If I'm involved in the process concerning my training I perform better.	+4
27	<i>I become stressful if my coach involves me in important matters regarding my training.</i>	-4
18	<i>Neither feedback nor social support are crucial for my performances in sport.</i>	-4
16	<i>I become uncommitted if my coach includes me in decisions regarding my sport.</i>	-5

Note: Included mixed cases, 21 coaches loaded on factor A.

3.2 Factor B: Servant leadership - caring and non-task controlling

Viewpoints loading on factor B were held of two (pure cases) of the participant coaches. Compared with the other respondents' general variables (sports, experience and education level) they are both involved in individual sport (athletic) with a long coaching and teaching experience, but with no difference in educational background. On the positive side (see Table 6), they emphasize the importance of not being met by instructive behavior from the coach (statement number 24 and 33). The coaches who are loading factor B believe that clear instructions negatively affect motivation and involvement negatively affects focus (statement number 27). Therefore, this coaching behavior is undesirable. The most extreme statement on the negative side further emphasize that there is no need for clear instructions to develop the athlete's performance (statement number 10). The lack of faith in instruction as a pedagogical measure appear to be a main characteristic in factor B, which contradicts that a basic element in coaching is guided improvement the long term development of athletes. However, textbooks in motor learning and physical education have argued that instructions can be ineffective and the effect of instruction may depend on the skill and the performance level of the athlete (Schmidt & Wrisberg, 2008; Siedentop & Tannahill, 2000). An analysis of the general variables to the respondents loading on factor B shows that they are from athletics. In some of the athletics exercises like distance running, technical skill instruction may be consider excessive especially if the athlete has developed and automatized a rather efficient running technic. Coaching these athletes is more about creating a training program with recommended training volume (training frequency, duration and intensity).

The two other psychological statements representing factor B negatively emphasizes that either a close relationship with a coach or involvement are needed to affect emotions such as curiosity and focus (statement number 28 and 31). However, coaches disagree with these statements indicating that the respondents view a close relationship and involvement from the coach as suitable. Jowett (2005) claims that coach athlete relationship can be described in a) prizewinning and b) helpful/caring relationship dimensions. The two dimensions are interrelated and the prizewinning category has effective and ineffective as sub-dimension, while the helpful/caring relationship has successful and unsuccessful subcategories. The belief that instruction is not efficient, which represent one belief loading one factor B may be categorized in the ineffective prizewinning dimension in Jowett's (2005) taxonomy. The belief that closeness and athlete involvement are desirable can be considered as a basic prerequisite developing a successful relationship, which is a category in the helpful/caring dimension in the taxonomy.

According to Stone, Russell, and Patterson (2003, 2004) servant leaders gain influence in a non-traditional manner that derives from servant hood itself. They

allow extraordinary freedom for followers to exercise their own abilities and place much higher degree of trust than would be the case in any leadership style required by the leader to be directive. The coaches loading on factor B seem therefore to have elements of a servant leadership.

Table 5

Distinguished Statements Loading on Factor B

Number	Statement	Strength
24	I am losing my curiosity when my coach gives me clear instructions.	+5
27	I become stressful if my coach involves me in important matters regarding my training.	+4
33	If I'm told exactly what to do I lose my motivation.	+4
31	<i>I'm calm and steady regardless of a close relationship with my coach or not.</i>	-4
28	<i>I'm curious regardless of involvement or not from my coach.</i>	-4
10	<i>Clear instructions regarding what I am supposed to do develop my performances.</i>	-5

Note. Included mixed cases, 20 cases loaded on factor B.

4. Discussion

The 23 coaches who participated in this investigation were instructed to sort 36 statements about different views on coaching behaviours, and rank the statements on a scoreboard ranging from +5 to -5 regarding what they believe are expected behavior in their roles as coaches in sport. Based on their experience they were asked to reflect on the content of the statements and prioritized them in accordance with their own personal view. The results show that 21 out of the 23 coaches, (when mixed sorts are included) loaded significant positive on Factor A: Involvement leadership (Table 3). This factor counts for 38% of the variance. Seven coaches (when mixed sorts are included) loaded on factor B: Servant leadership (Table 3). However, only one coach loaded significant positive on factor B and the rest of the loadings were negative.

After analysing the two different factors it is clear that the factors represent individual viewpoints that clearly separate them from each other. The negative correlation between the factors confirms this as well as the scores on each statement representing the two factors (Appendix). In the discussions below these two factors will therefore be treated based on their typical individual viewpoints.

4.1 *Involvement leadership*

The theory of transformational leadership was developed by Bass (1985) and he proposes that transformational leaders display certain characteristics such as showing concern and care for each subordinate, and stimulating them intellectually to think about old problems in an innovative way. In sport, Charbonneau, Barling, and Kelloway (2001) showed that intrinsic motivation mediate the relationship between transformational leadership and sport performance, suggesting that transformational leadership may enhance intrinsic interest in the task. The following strong statement loading on factor A "I become curious and interested if my coach involves me in matters concerning my training" (4) and "Neither feedback nor social support are crucial for my performances in sport" (-4) seems to be beliefs that correspond with elements of transformational leadership. A belief in athlete involvement in the training process seems to be a prerequisite to stimulate athletes intellectually, and provide a foundation for innovations. A fundamental belief in involvement is also a precondition for stimulating athlete autonomy and competence, which are cornerstones in self-determination theory (Ryan & Deci, 2002). A basic assumption in self-determination theory is that intrinsic motivation is affected by the extent to which the fundamental human needs for competence, autonomy, and relatedness are fulfilled or satisfied. According to Amorose and Anderson-Butcher (2007) there are motivational benefits of autonomy-supportive coaching behavior (Amorose & Horn, 2000). The respondents loading on factor A strongly disagree that feedback and social support are crucial for performance in sport indicating that these coaching behavior are important for performance enhancement. This finding also seems to be in line with transformational leadership, which emphasizes caring and concern for subordinates or athletes.

Interestingly, 21 out of the 23 coaches in this study loaded on factor A when mixed sorts are included. There are five mixed sorts across the two factors and they are all loading negatively on factor B. Thus, the views representing factor A are strong among the coaches in this study and factor B seems to represent a contrasting view compared with factor A; since their statements are sorted completely different (see Appendix and the different scores for each statement on factor A and B).

Viewpoints representing factor A in this study do not solely confirm earlier research on coaching behaviours (Chelladurai, et al., 1988; Horne & Carron, 1985; Moen & Sandstad, 2013; Riemer & Chelladurai, 1995). This research shows that coaching behaviour associated with training and instruction, positive feedback, and social support are highly correlated with athletes' satisfaction and their intrinsic motivation. Viewpoints that are associated with positive feedback and social support are represented in factor A, but viewpoints associated with training and instructions are not. This is rather surprising, while instructive behaviour from a coach, especially with junior athletes, might be necessary to

meet the quality that is needed to enhance the athlete's performance level (Ericsson, 2009). Importantly, exercise that is needed to improve an athlete's performance levels is not found to be a playful enjoyment (Ericsson, et al., 1993). Developing an athlete's level of performance is an effortful endeavour that takes engagement, curiosity and inspiration. Interestingly, the coaches that are loading on factor A in this study believe that coaching behaviour promoting involvement has an affect on these emotions.

The belief in the involvement of athletes during the training process can be considered as a basic value and a prerequisite to empower the athlete to become more independent and take ownership of the learning process. According to Jowett (2007) is an interdependent relationship between coach and athlete described in terms of closeness, commitment and complementarity. A belief in athlete involvement in the training process, as well as an opinion of the necessity of social support and feedback in the learning process seems to be an important precondition to promote a positive and healthy coach-athlete relationship. However, athlete involvement is also a necessary precondition establishing a more democratic leadership.

One can ask if the emphasis on athlete involvement and social feedback among these coaches on the one side, together with the absence of determined behavior such as criticism and instruction on the other, are too friendly of nature for coaches who are working to improve a junior athlete's levels of performance. A recent study found that junior athletes expect a paradoxical mixture of humility (involvement, positive feedback, a personal relationship and social support) and determinate behavior (criticism and instructions) from their coaches (Moen & Sandstad, 2013).

4.2 Servant leadership - caring and non-task controlling

The most psychologically significant statements representing factor B seem to represent the view that an athlete does not need instructions from a coach to affect motivation, performance and emotions. Two of the most psychological negative statements representing factor B (statements number 28 and 31) are understood as concerns among the coaches loading on this factor. The consensus representing factor B seems that an athlete is expected to act independently of the coach and that the coach does not expect to take too much responsibility regarding the athlete. Thus, the way coaches loaded factor B suggests that they believe their role is expected to be in the background and not being involved too much in the work with the athlete and the athlete is expected to take responsibility him- or herself. Werthner & Trudel (2006) suggest that elite coaches learning can be understood in terms of mediated, unmediated and internal processes. Where in a mediated learning situation a coach directs the athlete, opposed to no coaches present in unmediated situations. Thus, the

athlete must take the initiative and the responsibility for choosing what to learn in unmediated learning situations. These concepts may also be applicable concerning athlete learning and coaches loading on factor A seems to believe strongly in learning these young athletes is a mediating process, while coaches loading on factor B believe this is an unmediated process.

4.3 Conclusion, implications and future research

The aims of this study were to explore coaches' opinion about how and eventually which coaching behavior affects the athletes. Furthermore, discover patterns among the participants and identify coaches who express similar subjective views, and clarify if Q methodology is suitable for studying coaching beliefs. The present findings show that the coaches share some common viewpoints represented in two different factors (consensus). Each factor represents congruent views related to the role of coaching expectations in sport. The dominant view (factor A) is that coaches believe that their athletes expect involvement leadership, whereas servant leadership was dominant in factor B, a view that only a few of the coaches shared.

The coaching role in sport is relatively free with great opportunities for the individual to create and design it based on personal convictions (Heinemann, 1983). Thorsen (2009) argues that Q methodology stimulates participants' awareness of their own position related to the research question. Based on findings from studies in cognitive therapy, which shows that attitudes, beliefs and expectations can shape peoples reality and behavior, we assume that the finding in this study is important for coaching in sport (David, Lynn & Ellis, 2010). We often assume that coaches' values are observable in their behavior or wish that it should be. However empirical examination shows that the connection is not as straightforward as the coaching literature would have us to believe (Lyle, 1999). This is because little account is taken of the contextual pressure, which also influences coaching behavior (Cassidy, Jones, & Potrac, 2009). These beliefs seem to be easy to say and difficult to keep, and the link between coaches' beliefs' and their actions has rarely been empirically investigated (Lyle, 1999). Further research should illuminate the development of these beliefs and clarify how coach education influences each factor. The findings in the present study show that a Q methodology approach can be a helpful in the exploration of coaching beliefs

4.4 Limitations

Q studies are not designed to generalize results to larger populations or to determine causal relationship between variables or estimate prevalence (Øverland, Thorsen, & Størksen, 2012). Generally, Q methodology explores subjective views and this was the intent in studying coaches' perceptions of

significant beliefs. Qualitative research has occasionally been criticized for modest quality (Mays & Pope, 2000), but clear guidelines for conducting a Q study should accommodate this critic. Brown, (1980) argue that Q methodology is a less biased than questionnaires, where the content can be predetermined, and interviews where it is up to the researcher to categorize the results.

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Appendix A

<i>Statements</i>	<i>Factors</i>	
	<i>A</i>	<i>B</i>
1. My motivation for training increases when my coach involves me.	5	-3
2. If I'm involved in the process concerning my training I perform better.	4	-3
3. My coach does not have to be open for questions.	-1	2
4. I become curious and interested if my coach involves me in matters concerning my training.	4	-2
5. My motivation increases when my coach is concerned about my personal well-being.	3	-2
6. If I'm supposed to achieve good performances my coach needs to focus on my personal welfare.	-2	3
7. My situation becomes less stressful when my coach contributes in personal affairs.	1	0
8. A personal and close relationship with my coach makes me enthusiastic concerning my training.	2	0
9. My motivation increases when I'm told exactly what to do.	-1	-1
10. Clear instructions regarding what I am supposed to do develop my performances	3	-5
11. I keep my focus if the coach intervenes in training and explain what is right and wrong.	0	-3
12. I become curious if my coach gives me clear instructions about what I need to do.	1	0
13. My motivation increases when my coach takes decisions that concern me.	-3	0
14. My performances are not good when my coach denies complying with my opinions.	1	-1
15. My coach needs to consult me if I'm supposed to have an effective focus.	2	2
16. I become uncommitted if my coach includes me in decisions regarding my sport.	-5	3
17. My motivation increases when I receive positive feedback.	3	-2
18. Neither feedback nor social support is crucial for my performances in sport.	-4	1
19. A close and personal relationship with my coach makes me stressful.	-3	2
20. My curiosity is best stimulated when the relationship with my coach is not too close and personal.	-1	1
21. I lose my engagement when I'm observed by my coach and receive no feedback.	-1	-2

22. I perform at my best when I have to clarify my own task for training.	0	1
23. I become insecure if a coach does not tell me exactly what to do.	2	-1
24. I am losing my curiosity when my coach gives me clear instructions.	-3	5
25. My motivation decreases when my coach needs my approval in important matters concerning my training.	0	3
26. I'm not able to perform if my coach often asks me for approvals in important matters.	-2	0
27. I become stressful if my coach involves me in important matters regarding my training.	-4	4
28. I'm curious regardless of involvement or not from my coach.	0	-4
29. My motivation increases when my coach does not have focus on personal issues.	0	1
30. In order to develop my performances I also need critical feedback from my coach.	2	-1
31. I'm calm and steady regardless of a close relationship with my coach or not.	1	-4
32. Whether my coach is concerned about personal issues or not do not affect my curiosity.	-2	0
33. If I'm told exactly what to do I lose my motivation.	-2	4
34. I perform at my best when my coach just observes what I do during training.	-1	1
35. I lose my focus when it is too much instructions.	1	-1
36. It is easier to be curious when the coach is more in the background.	0	2

* Translated from Norwegian to English by the authors.