How Can Autonomy Support From the Coach, Basic Psychological Needs, and the Psychological Climate Explain Ego and Task Involvement?

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Article

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Abstract: This article considers the basic psychological needs theory and tries to determine how much autonomy support from a coach is required for basic psychological needs and how autonomy, competence, relatedness, and the psychological motivational climate can explain task and ego involvement in a group of young elite ice hockey players. Our three hypotheses were as follows: autonomy support from the coach will have an impact on motivational involvement, all three basic needs will have an impact on motivational involvement, and motivational involvement will be explained by the motivational climate. A total of 175 male elite ice hockey players from Norway, ranging in age from 15 to 18 years old, answered questionnaires about autonomy support, perceived motivational climate, achievement goal orientation, and basic psychological needs. A multiple regression analysis was run to predict ego–task involvement using autonomy support from the coach, the need for autonomy, the need for competence, the need for relatedness, the task climate, and the ego climate. The only two variables that statistically significantly predicted ego–task involvement were autonomy support from the coach and the ego climate. The analysis revealed that the athletes had a higher score on task than ego involvement, but when this was transformed into two variables (high and low) for task and ego involvement, we found that most players scored high for both task and ego involvement. We found that autonomy from the coach had a positive relationship with a high score for players on both task and ego involvement. We also found that the three basic psychological needs had no impact on the motivational involvement of the athletes. Lastly, we found that the ego climate had an impact on the motivational involvement. There was a positive relationship between a high score for the ego climate and a high score for both ego and task involvement.

Keywords: autonomy support; basic needs; psychological climate; ego involvement; task involvement

1. Introduction

This article considers the basic psychological needs theory (BPNT) by Deci and Ryan[1-3] and aims to determine how well the autonomy support from the coach[4, 5], the basic psychological needs, autonomy, competence, and relatedness[3 2 6, 7], and the psychological motivational climate[8, 9] can explain task and ego involvement in a group of young elite ice hockey players. We consider both direct and indirect effects on the involvement.

The self-determination theory is a meta-theory of the autonomous control of behavior and voluntary engagement[10]. The SDT argues that motivation emerges from the interaction between social contextual factors and human nature[11]. The theory explains human behavior and motivation based on differences in motivational orientations, interpersonal perception, and contextual influences on motivation[12].

The SDT assumes that people actively seek optimal challenges and are growth-oriented. They will take part in activities for enjoyment and interest in the activity itself[10]. Furthermore, the theory assumes that maximal well-being and optimal performance occur when an athlete's innate needs for autonomy, relatedness, and competence are satisfied[13]. Autonomy-supportive environments that satisfy these three basic needs tend to increase an athlete's persistence, effort, and well-being[1, 2, 5, 12]. Coach autonomy support shows a strong positive correlation with intrinsic motivation, as well as

integrated and identified regulation[14, 15]. Athletes who perceive autonomy support from their coach have a higher chance of scoring highly for autonomic regulation, according to the self-determination theory[16, 17]. There is also a strong positive correlation between coach autonomy support and an athlete's need for autonomy and relatedness. The association with the need for competence is in the upper-moderate range[14].

Autonomously regulated behavior is associated with positive outcomes compared with controlling environments, as mentioned earlier. Controlling environments lead to more prosocial behavior against opponents, but also among teammates[18]. Coach autonomy support predicts an athlete's basic need satisfaction for autonomy, competence, and relatedness[19]. Basic need satisfaction also predicts a greater subjective vitality when engaged in a sport. Participants with low levels of autonomy are more susceptible to feeling emotionally and physically exhausted from their sport investment[20, 21].

The basic psychological needs theory (BPNT) is one out of six mini-theories within the self-determination theory (SDT)[2, 10, 22]. The theory elaborates on the concept of evolved psychological needs and their relationships to psychological health and well-being. The BPNT argues that psychological well-being and optimal functioning are predicated by autonomy, competence, and relatedness. Autonomy requires the inner endorsement of behavior. People perceive that their behaviors are derived from within themselves[14]. Relatedness requires a sense of mutual belonging, feeling cared for by significant others, and a sense of mastery and succeeding at challenging tasks[14]. All three needs are essential, and if any are missing, there will be distinct functional costs[3, 23]. The construct of basic psychological needs is, in short, the main predictor of human motivation[24].

Task and ego involvement are the two main types of goals related to the achievement goal theory (AGT)[22, 25]. The theory postulates a dichotomous model with two types of motivation: task and ego motivation. AGT proposes that an athlete's goal orientation and their perceived motivational climate will influence their behavior[24]. Task-motivated athletes are mainly interested in subjective indices of success, such as tactical development, technical self-improvement, skill-learning, and the mastery of challenges. Ego-motivated athletes look at themselves as successful only if they perform better than others, regardless of personal improvements in performance that they have achieved. Beating others is the main preoccupation of ego-orientated athletes[25]. According to the AGT, an individual's performance in achievement-related activities fluctuates based on their participation level; that is, directed towards ego- or task-related goals. Therefore, a person can be more or less ego- and task-involved at different times during their task engagement. Bruner et al.[26] indicated that the theory is based on the idea that variations in people's judgment of their ability and their definition of successful accomplishments are vital for understanding athletes' motivational processes. The perceived motivational climate in sports influences the process of setting and pursuing goals, regardless of whether an athlete can be said to be task- or ego-oriented. Individuals can have a high-task/high-ego, low-task/low-ego, low-task/high-ego, or high-task/low-ego orientation during their participation in sporting activities, significantly influencing their behaviors and outcomes[27]. Indeed, an interaction between an individual's intrapersonal level and motivational climate generated by such social agents as parents, coaches, and peers determines their achievement of goals.

One important situational factor for the achievement goals is the intervening variable of the motivational climate, which regulates the relationship between goal orientation and athletic performance. The motivational climate is the perceived structure of the achievement environment, which is mediated by the coach's attitudes and behavior[28]. Two types of climates can be identified. When the athlete perceives that the coach places an emphasis on personal effort and skill development, we name this a "mastery" climate. On the other hand, in an "ego-oriented" climate, the athletes are compared and pitted against each other, and their mistakes are criticized and punished[29]. There is a strong correlation between coach autonomy support and the sports climate. Research also supports the idea that a task involving a motivational climate increases the perception of the need for autonomy, competence, and relatedness, whereas an ego-involving climate undermines these needs[30]. A task environment is derived from the perceived support from the coach and task-oriented athletes[16].

A task-oriented climate has a perceived advantage over an ego-oriented climate. One possible reason for this could be that the athlete is encouraged to focus on factors within their control in a task environment. In an ego-oriented environment, athletes tend to use social comparison processes when assessing their own competence[22]. It is important to cultivate a task-oriented climate where athletes value skill mastery, intrinsic motivation, and effort, rather than an ego-oriented climate, where the paramount goal is to defeat others. Such a task-oriented climate can be cultivated by the coach's feedback, focusing on the athlete's performance relative to self-referenced criteria of improvement and achievement[24].

Perceived ego-oriented climates are associated with negative worries and effects. In contrast, perceived task-oriented climates are positively associated with outcomes such as intrinsic motivation, positive effects, perceived competence, and feelings of autonomy and flow[31].

The aim of this study was to consider the relationships among an athlete's perceived autonomy support from the coach, the three basic psychological needs (autonomy, competence, and relatedness), the psychological motivational climate of the team (task or ego climate), and the athlete's motivational orientation (ego or task involvement). We computed the motivational involvement into groups of low ego and low task, low task and high ego, high task and low ego, and finally, high task and high ego. We expected that autonomy support from the coach would have an impact on motivational involvement. We also expected that motivational involvement would be explained by the three basic psychological needs and the motivational climate. Specifically, and in line with previous research[2, 3, 7, 16-18, 20, 24, 31], the following were hypothesized:

Hypothesis 1. *Autonomy support from the coach will have an impact on motivational involvement.*

Hypothesis 2. *All three basic needs will have an impact on motivational involvement.*

Hypothesis 3. *Motivational involvement will be explained by the motivational climate.*

2. Materials and methods

2.1. Participants

The participants were 175 male ice hockey players from Norway, ranging in age from 15 to 18 years (M = 15.91, SD = 0.45). They participated in the Norwegian Ice Hockey Federation's elite camp. There were 7 goal keepers, 54 defenders, 99 forwards, and 15 players that were both defenders and forwards. A total of 51 players had represented the national U-18 team, and 118 (70%) players were born from January to July. Only 20 (11%) were in the last quartile. We obtained parental consent for the players' participation in the study. The study was approved by the Norwegian Centre for Research Data.

2.2. Procedure

The data were collected during the Ice Hockey Federation's elite camp. All of the participants participated. The players had one hour to complete the questionnaires.

2.3. Instruments

2.3.1. Autonomy Support

To examine the perceived coach autonomy support, we used the short version of the sport climate questionnaire (SCQ)[4], with six items worded in terms of "my coach" (e.g., "I feel understood by my coach") (α = 0.84). The questions were answered on a Likert-type scale from 1 to 7 (where 1 = does not agree at all and 7 = completely agrees). High average scores represented a high level of perceived autonomy support. The scale has been used before in the sports domain, and evidence of adequate reliability and validity has been obtained[5, 21].

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2.3.2. Perceived Motivational Climate

The perceived motivational climate in sport questionnaire-2 (PMCSQ-2) was created to determine the athletes' perceptions of goals when operating in an athletic setting[6, 32, 33]. The PMCSQ-2 has six subscales, which were transformed into two higher-order scales. One was labeled as "task-climate" (17 items, α = 0.90), which included cooperative learning, important role, and effort and improvement. The second one was the "ego-climate" (16 items, α = 0.91), which included punishment for mistakes, unequal recognition, and intrateam rivalry[32]. All alpha values were satisfactory[34]. To complete the PMCSQ-2, the players were asked to consider their participation in ice hockey and to indicate, using a five-point Likert-type scale (1 = strongly disagrees, 5 = strongly agrees), whether they agreed with claims reflecting a task-involving (e.g., "in my team, players are encouraged to work on weaknesses") or ego-involving (e.g., "in my team, players are encouraged to outdo their teammates") climate.

2.3.3. Achievement Goal Orientation

To measure the dispositional goal orientation, we used the task and ego orientation in sport questionnaire (TEOSQ)[35, 36]. The TEOSQ has a two-factor structure, representing task (seven items, α = 0.77) and ego (six items, α = 0.86) involvement. Considering that the questionnaires were administered in an ice hockey context, the players were encouraged to think about how successful they felt in relation to their teammates and then indicate on a five-point Likert-type scale (where 1 = strongly disagrees and 5 = strongly agrees) whether they agreed or disagreed with the items reflecting a task orientation (e.g., "I feel successful when I work really hard") or an ego orientation (e.g., "I feel successful when others can't do as well as I can"). The scale has been used before, and evidence of adequate reliability and validity has been obtained[37].

2.3.4. Basic Psychological Needs

The satisfaction of basic psychological needs (BPN) was measured using the basic psychological needs in exercise scale (BPNES) with 12 items[38, 39]. The questions were adapted for ice hockey training. The players reported their satisfaction regarding the need for autonomy (four items, e.g., "the way I exercise is in agreement with my choices and interests", α = 0.74), competence (four items, e.g., "I feel I perform successfully the activities of my exercise program", α = 0.70), and relatedness (four items, e.g., "my relationships with my teammates are close", α = 0.78). To complete the BPNES, the players were asked to consider the assertions on a 7-point Likert scale (where 1 = does not agree at all and 7 = completely agrees). The scale has been validated through several studies[40, 41].

2.4. Data Analysis

All statistical analyses were conducted using IBM SPSS (version 28.0). The validity of the scales was analyzed via a confirmatory factor analysis (CFA), and Cronbach's alpha was employed to assess the internal reliability of each scale[42]. Descriptive statistics and bivariate correlations were calculated (Table 2). The ego and task involvement were also computed into new variables with only two values: low and high ego/task (Table 1).

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Table 1. Cross-tabulation of task and ego involvement among the players, divided into low and high.

		Low	High	Total
Ego involvement	Low	0	69	69
	% of total	0	42.6%	42.6%
	high	0	93	93
	% of total	0	57.4%	57.4%
Total		0	162	162
	% of total	0	100%	100%

Low was considered ≤3 and high was considered >3. We computed one new variable out of these two variables. This variable, "ego–task involvement", was categorized into: low ego–low task, low ego–high task, high ego–low task, and high ego–high task. Paired-sample *t*-tests were conducted to test the difference in the means between the variables.

We carried out a multiple regression analysis, where "ego–task involvement" was the dependent variable. The independent variables included autonomy support from the coach, the need for autonomy, the need for competence, the need for relatedness, the task climate, and the ego climate. The Durbin–Watson test was used to detect the presence of an autocorrelation in the residuals and the variance inflation factor (VIF) was used to measure the impact of collinearity among the variables. Both were satisfied.

3. Results

3.1. Descriptive Statistics and Correlations

The descriptive statistics for all variables are presented in Table 2. The Cronbach internal reliability coefficients for all scales were satisfactory (alpha range = 0.70–0.91). The players had significantly (sign = 0.01) higher scores for task involvement (4.58) than ego involvement (3.34).

The "perceived autonomy from the coach" had a score of 4.89, which was only slightly above the median. The players had a high score for all three basic psychological needs, with the highest score for the "need for relatedness" (6.20). The task climate (4.10) had a significantly higher score (sign = 0.01) than the ego climate (2.90).

Table 2. Descriptive statistics and internal consistency for each measure and bivariate correlations among study variables.

	1	2	3	4	5	6	7	8	9
1. Task climate									
2. Ego climate	-0.47**								
3. Need for autonomy	0.61**	-0.20*							
4. Need for competence	0.56**	-0.24**	0.72**						
5. Need for relatedness	0.60**	-0.30**	0.54**	0.64**					
6. Autonomy support	0.60**	-0.39**	0.46**	0.42**	0.40**				
7. Ego-task involvement	-0.20*	0.34**	-0.09	-0.12	-0.20*	0.04			
8. Ego involvement	-0.26**	0.42**	-0.11	-0.08	-0.18*	0.03	0.81**		
99. Task involvement	0.35**	-0.14	0.31**	0.44**	0.36**	0.24**	0.03	0.02	
N	160	158	163	163	164	166	162	162	169
M	4.10	2.90	5.65	6.00	6.20	4.89	1.57	3.34	4.58
Str.d	0.60	0.82	0.89	0.69	0.77	1.10	0.50	0.91	0.42
α	0.90	0.91	0.74	0.70	0.78	0.84	-	0.86	0.77
**. Correlation is significant at the 0.01 level (2-tailed).									
*. Correlation is significant at the 0.05 level (2-tailed).									

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There were positive correlations between all three basic needs, task involvement, and task climate at the 1% level. Ego involvement had a positive relationship with the ego climate (sign = 0.01) and ego–task involvement (sign = 0.01), and a negative relationship with the task climate (sign = 0.01) and the need for relatedness (sign = 0.05).

There were significant differences (sign = 0.01) between ego and task involvement, between the ego and the task climates, among the need for autonomy, the need for competence, and the need for relatedness, and between the need for competence and the need for relatedness.

None of the players were classified as being low on task involvement. A total of 69 players (42.6%) were low for ego and high for task, and 93 (57.4%) were high for both ego and task involvement (Table 1).

3.2. Regression Analysis

A multiple regression analysis was run to predict the ego–task involvement using autonomy support from the coach, the need for autonomy, the need for competence, the need for relatedness, the task climate, and the ego climate. The only two variables that statistically significantly predicted the ego–task involvement were autonomy support from the coach (std. beta = 0.28, sign = 0.05) and the ego climate (std. beta = 0.34, sign = 0.01). The model is significant (F = 3.82, sign = 0.01, R^2 = 0.11) (Table 3).

Table 3. Hierarchical regression analysis on how autonomy support, need for autonomy, need for relatedness, task- and ego- climate predict the variable ego and task involvement. Ego and task involvement.

	Model 1	**Model 2**	**Model 3**
	B	B	B
Constant	1,56.**.	2,25.**	1,26*
Autonomy support	0.00	0.10	0.28*
Need for autonomy		0.02	0.05
Need for competence		-0,04	-0.04
Need for relatedness		-0,20	-0,10
Task climate			-0.14
Ego climate			0.34**.
R^2	-0.01	0.01	0.11
F	0.00	1.20	3.82.**.
ΔF		1.61	8.75.**.
**. Correlation is significant at the 0.01 level (2-tailed).			
*. Correlation is significant at the 0.05 level (2-tailed).			

4. Discussion

This study investigated the relationship among the perceived autonomy support from the coach, basic psychological needs, the motivational climate, and achievement goals in 15–18-year-old Norwegian elite ice hockey players. As far as we know, this is the first study to examine the concurrent effects of perceived autonomy support, the three basic psychological needs, and the motivational climate on an athlete's task and ego involvement (achievement goals). We performed a regression analysis in this study, and the regression coefficient was low (R^2 = 0.11). This means that there must be other independent variables that would explain the dependent variable.

According to the descriptive analyses, the ice hockey players showed a medium level of perceived autonomy support from their coach, and they had a high score for task climate and task involvement. Contrary to this, they had a medium score for ego climate and ego involvement. This is supported by earlier research[43, 44]. A total of 57% of the players had a high score for both task and ego involvement, and 43% had a high score for task involvement and a low score for ego involvement. This is supported by earlier studies[27].

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The results showed a strong relationship between the perceived autonomy support from the coach and all three basic psychological needs (sign = 0.01). Earlier studies among youth swimmers uncovered that autonomous behavior from the coach positively predicted the satisfaction of the needs for competence and relatedness[43]. Another study on young Spanish footballers found a positive relationship between coach autonomy support and an index of psychological needs' satisfaction[5]. We also know that autonomy support is strongly positively associated with athlete well-being and negatively associated with distress[14]. Earlier studies have also shown a strong positive association between autonomy support from the coach and an athlete's basic psychological needs for autonomy, competence, and relatedness. There is also a very strong association between autonomy support and other climate or behavioral supports for an athlete's basic psychological needs: competence support, relatedness support, structure, involvement, and tasks involving climate[14] .

Our first hypothesis was that autonomy support from the coach will have an impact on motivational involvement. There was a positive relationship between the motivational involvement and autonomy support from the coach. This means that those players who scored high for both ego and task involvement had a high score for autonomy support from the coach. According to the theory, we would expect that a high score for autonomy support from the coach would have a negative relationship with a high score for ego–task involvement[14, 45]. The fact that the players were high for both task and ego involvement can explain this positive relationship with autonomy support, even if it is a bit surprising. Hence, the first hypothesis was rejected.

The next hypothesis was that all three basic needs will have an impact on motivational involvement. In our analysis, none of the basic needs had any impact on the motivational involvement. All three had a positive correlation with task involvement. On the other hand, there was no significant correlation between the need for autonomy or the need for competence and the task–ego involvement. Instead, there was a negative correlation (sign = 0.05) with the need for relatedness. We know that most players scored high for both ego and task involvement, and this could have led to the fact that the basic needs did not have any impact on the motivational involvement. This is not in line with the results of earlier research, which indicated that all three needs are essential for human motivation and if any are missing, there will be distinct functional costs[3 24, 25 46]. An explanation for this result could be the high score for both ego and task involvement. Thus, this hypothesis was also rejected.

Our last hypothesis was that motivational involvement will be explained by the motivational climate. The ego climate had a positive impact (sign = 0.01) on the task–ego involvement. This hypothesis was confirmed. The ego climate will cause more players to score high for ego orientation, even if most of the players had a higher score for task than for ego involvement. We know that a task-oriented climate has a perceived advantage over an ego-oriented climate[22, 27]. In an ego-oriented environment, athletes tend to use social comparison processes when assessing their own competence[22]. It is important to cultivate a task-oriented climate, where athletes value skill mastery, intrinsic motivation, and effort, rather than an ego-oriented climate, where the paramount goal is to defeat others. It might be that the coaches for these athletes encourage both a task- and ego-oriented climate, depending on the situation. The focus from the coach on daily training and competition can be different. Coaches, even if they say that they are task-oriented, can become more ego-oriented depending on the importance of the match, and this will probably also have an influence on the players' perception of the team climate [24]. We also know that perceived ego-oriented climates are associated with negative feelings and effects[31]. One possible reason for this could be that athletes are encouraged to focus on factors out of their control in an ego environment. Competition can lead athletes to consistently perform their best. It can improve their quality of performance. Having two players compete for a spot on a hockey team should lead to a better team, because each player is trying to improve as much as she/he can in order to make the team better and contribute to team success. However, coaches must understand that competition does not automatically increase quality, and they must learn to counteract the potential in pressured situations so that quality is not reduced and so that athletes do not adopt negative solutions to reach a certain competition standard[47].

5. Conclusions

The athletes had a higher score task rather than ego involvement, but when we transformed the data into two variables (high and low) for task and ego involvement, we found that most players were high for both. We also found that autonomy from the coach had a positive relationship with players that had a high score for both task and ego involvement. This was a bit surprising.

Furthermore, we found that the three basic psychological needs had no impact on the motivational involvement of the athletes.

Lastly, we found that the ego climate had an impact on the motivational involvement. There was a positive relationship between a high score for the ego climate and a high score for both ego and task involvement.

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