

Association between basic psychological needs of the self-determination theory and perception of group cohesion among high-performance futsal athletes

Associação entre as necessidades psicológicas básicas de autodeterminação e a percepção de coesão de grupo em atletas de futsal de alto rendimento

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Abstract – This study aims to investigate the association between satisfaction of basic psychological needs of the self-determination theory, and perception of group cohesion among male futsal athletes. In total, 301 athletes from 20 teams, participants of the Brazilian Futsal League participated in this study. The instruments used were the Basic Needs Satisfaction in Sport Scale (BNSSS) and the Group Environment Questionnaire (GEQ). Data analysis was conducted through the Structural Equation Modeling. Results revealed that the satisfaction of basic psychological needs presented significant association with group cohesion, explaining 28% of Task Cohesion and 63% of Social Cohesion variances. The satisfaction of the three basic psychological needs is associated with Task Cohesion, while only the satisfaction of basic psychological needs of Relatedness and Competence was associated with Social Cohesion. It was concluded that, in the context of high-performance futsal, the satisfaction of athletes with their basic psychological needs is associated with involvement with team goals and the likelihood of making friends within the group.

Key words: Group; Motivation; Sport.

Resumo – Este estudo investigou a associação entre a satisfação das necessidades psicológicas básicas, da teoria da autodeterminação, e a percepção de coesão de grupo em atletas de futsal do sexo masculino. Participaram 301 atletas das 20 equipes participantes da Liga Nacional de Futsal. Como instrumentos foram utilizados a Escala de Necessidades Básicas no Esporte (BNSSS) e o Questionário de Ambiente de Grupo (GEQ). A análise dos dados foi conduzida por meio da Modelagem de Equações Estruturais. Os resultados revelaram que a satisfação das necessidades psicológicas básicas apresentou associação significativa com a coesão de grupo, explicando em 28% a variância da Coesão para Tarefa e 63% da Coesão Social. A satisfação das três BPN está associada a Coesão para a Tarefa, enquanto que apenas a satisfação das necessidades psicológicas básicas de Relação e Competência se associou com a Coesão Social. Concluiu-se que, no contexto do futsal de alto rendimento, a satisfação do atleta em relação às suas necessidades psicológicas básicas está associada ao envolvimento com as metas da equipe e à probabilidade de desenvolver amizades dentro do grupo.

Palavras-chave: Esporte; Grupo; Motivação.

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INTRODUCTION

In the quest for sporting excellence, researchers in the field of sports psychology and sport teams have dedicated themselves to the study and application of techniques that seek to develop and optimize the psychological capacities of athletes^{1,2}. The improvement of these abilities aims at obtaining the maximum performance of athletes, either individually or collectively³. Among the psychological variables related to group dynamics, interpersonal relations play a fundamental role in achieving success⁴.

However, for a group to develop interpersonal relations in a satisfactory way, it is necessary to understand in depth a specific psychological aspect, group cohesion^{1,2}. According to Carron, Brawley and Widmeyer⁵, group cohesion is a process that changes over time and refers to the tendency of a group to unite and remain united in the pursuit of its instrumental goals and / or to fulfill the affective needs of components^{4,5,6}. There are two basic dimensions that explain cohesion: task cohesion, which refers to how much the group can join forces to perform tasks related to collective performance^{4,6} and social cohesion, which relates to the relationship beyond the sporting context and how pleasant it is for members to belong to a group⁶.

Previous studies have dealt with group cohesion in the Brazilian sports context, relating it to other potentially important psychological variables, such as perfectionism⁷, leadership⁸, anxiety⁹, athletic satisfaction¹⁰, stress¹¹ and motivation¹¹, which in turn is closely related to the satisfaction of basic psychological needs (BPN) of the self-determination theory, a variable that has been showing importance in the psychosocial development of athletes¹².

The Self-Determination Theory (SDT) is a macro-theory that addresses human motivation and personality in many aspects of life centered on different types of motivation^{12,13}. SDT has been the theoretical basis most used to investigate motivation in the most varied contexts¹²⁻¹⁴. Among the micro-theories that SDT covers, the BPN micro-theory, which postulates that the psychological well-being of subjects depends on the satisfaction of BPNs of Autonomy (ability to control their own actions), Competence (ability to feel efficient in face of the challenges of social life) and Relatedness (capacity to develop interpersonal relations) stand out^{13,14}. Thus, this micro-theory postulates that to the extent that athletes have these three BPNs satisfied, they will develop higher level of proactivity, athletic satisfaction, intrinsic motivation, and psychological health¹⁵. Specifically, encouragement and satisfaction regarding social relationships are factors that can contribute to the development of group cohesion. Thus, athletes will be more likely to be more involved in the group in search for the desired results and, consequently, increase the probability of achieving collective success^{12,15}. This fact demonstrates the relevance of investigating the relationship between BPN satisfaction of the self-determination theory and group cohesion.

Recent studies¹⁶⁻¹⁸ have pointed to positive associations between BPN satisfaction and group cohesion in sports, evidencing that the more the

athlete feels satisfied with the three BPNs, the greater the involvement with team tasks and goals and the better the social relationship among athletes. Despite these findings, no studies that have analyzed the isolated effect of each BPN on group cohesion in high-performance sports were found, especially in the Brazilian context, which is the gap that the present study aims to fill. Thus, this study becomes relevant since it aggregates knowledge and directs the work of physical education professionals and sports psychologists involved in the follow-up of athletes in the context of high-performance sports, enabling the use of results of this study as parameters for the creation of strategies for the enhancement of collective work and, consequently, the performance of sports teams.

Therefore, the aim of this study was to investigate the association between the satisfaction of BPNs of the self-determination theory and the perception of group cohesion in high-performance futsal athletes. The hypothesis is that the satisfaction of BPNs of the self-determination theory will be positively associated with both task cohesion and social cohesion.

METHOD

Participants

A total of 301 male futsal players (mean age 25.48 ± 4.90 years) were selected in a non-probabilistic form from all teams participating in the National Futsal League ($n = 20$), which is the most important competition of this modality in Brazil. Teams presented mean weekly training of 9.47 ± 1.43 , with duration of 2.04 ± 0.32 hours per training session. The following inclusion criteria were adopted: 1) To be over 18 years of age; 2) To have been in the team for more than three months; and 3) To be enrolled in the National Futsal League. All participants signed the Informed Consent Form.

Instruments

Group Cohesion. The Group Environment Questionnaire (GEQ)⁴, validated for the Brazilian sport context¹⁹, was used to evaluate the perception of group cohesion among athletes. GEQ is composed of 16 items answered along a nine-point Likert scale (1 = totally disagree to 9 = strongly agree). Items are distributed into four subscales: integration in the task group (ITG), integration in the social group (ISG), individual attraction to the task group (IAT) and individual attraction to the social group (IAS). Cronbach's alpha ($\alpha = 0.75$ to $\alpha = 0.82$) and Composite Reliability (CR) (ITG = 0.82, ISG = 0.78, IAT = 0.85, ISG = 0.80) for internal consistency were above acceptable according to psychometric recommendations²⁰. The Factorial Confirmatory Analysis (FCA) of the instrument presented acceptable adjustment after the establishment of covariance between errors of two items (14 and 16) of the ITG factor [$X^2(95) = 275.27$; $p = 0.001$; $X^2 / \text{gl} = 2.898$; CFI = 0.92; GFI = 0.91; TLI = 0.90; RMSEA = 0.08; $P(\text{rmsea} < 0.05) = 0.001$]. The values of the mean extracted variance (MEV)

for the convergent validity were satisfactory (ITG = 0.56, ISG = 0.51, IAT = 0.55, IAS = 0.50).

BPN. The Basic Needs Satisfaction in Sport Scale (BNSSS) validated for the Brazilian sport context², based on the Basic Needs Satisfaction in Sport Scale²², was used to verify the satisfaction of athletes in relation to BPN. The Brazilian scale is composed of 12 items distributed into three subscales: Competence, Autonomy and Relatedness. Responses are given on a seven-point likert scale from “Not entirely true” (1) to “Totally true” (7). The Cronbach alpha values of subscales varied from $\alpha = 0.71$ to $\alpha = 0.79$. FCA presented an acceptable adjustment [$X^2(50) = 117.00$; $p = 0.001$; $X^2 / gl = 2.34$; CFI = 0.93; GFI = 0.94; TLI = 0.91; RMSEA = 0.06; $P(\text{rmsea} < 0.05) = 0.039$], with satisfactory CC values (Competence = 0.76, Autonomy = 0.70, Relation = 0.75)²⁰. The MEV values for the convergent validity were acceptable (Competence = 0.49, Relatedness = 0.51, Autonomy = 0.50).

Procedures

The procedures adopted in this study were in accordance with the Criteria of Ethics in Research with Human Beings, according to Resolution No. 466/12 of the National Health Council. The study was approved by the Ethics Research Committee (protocol No. 248.363/2013). Initially contact was made with the Brazilian Confederation of Futsal, entity responsible for the accomplishment of the National League, to obtain authorization to carry out the study with athletes. Subsequently, all directors and coaches of teams were asked to authorize the study. Collections were carried out at the training sites of teams or at the hotels where they were concentrated during the year 2013. Questionnaires were applied collectively in a private room, with the absence of coaches, which completion lasted approximately 30 minutes. The order of questionnaires was randomized among participants.

Data analysis

Preliminary analysis. Spearman's correlation was used to verify the relationship among variables. Such analysis was conducted in SPSS v.22.0 software.

Structural Equations Modeling (SEM). The main analysis involved SEM, using AMOS 22.0 software. The hypothetical model verified the existence of five latent factors (Competence, Autonomy, Relatedness, Social Cohesion and Task Cohesion) based on items of respective questionnaires. SEM was tested following the two-step method: Step 1) specify and identify the measurement sub-model by performing FCA of the measurement model; and Step 2) specify and identify the structural sub-model, establishing trajectories and errors for endogenous variables²³. The model's quality of adjustment was analyzed according to adjustment indexes and the local adjustment was evaluated by the factorial loads and the reliability of items.

The verification of cases of outliers was evaluated by means of the square distance of Mahalanobis (D^2)²⁴. The univariate distribution was also evaluated through asymmetry (ISkI < 3.0) and kurtosis (IKuI < 10), and

multivariate distribution²⁵. According to Hair et al.²⁰, if the normalized Mardia coefficient is higher than 5.0, it is indicative that data do not have normal multivariate distribution, which is the case of the present study (multivariate kurtosis: Mardia = 62,315; normalized Mardia = 25.539). Thus, the Bollen-Stine Bootstrap technique was used to correct the chi-square value and the coefficients estimated by the maximum likelihood method²³. In addition, other adjustment indexes of the model were analyzed: X^2 / gl (values between 1.0 and 3.0), root mean error of approximation (RMSEA) (<0.08), goodness of fit index (GFI), comparative fit index (CFI) and Tucker Lewis index (TLI) (close to 0.95)^{24,25}. The interpretation of trajectory coefficients had as reference: little effect for factor loads <0.20, medium effect for factor loads up to 0.49 and great effect for factor loads > 0.5025. The significance level was set at $p < 0.05$.

RESULTS

Preliminary Analyses

Table 1 shows the descriptive values of the dimensions of each variable, in addition to the correlations among variables, especially the positive correlations of BPN in relation to group cohesion ($p < 0.05$) and autonomy subscales and competence with all, except for ISG.

Table 1. Correlation between BPN satisfaction subscales and group cohesion of futsal players

Variables	BPN				Group cohesion		
	1	2	3	4	5	6	7
1. Autonomy		0.46*	0.29*	0.35*	0.28*	0.30*	0.05
2. Competence			0.28*	0.24*	0.18*	0.14*	0.01
3. Relatedness				0.43*	0.42*	0.38*	0.25*
4. IAT					0.67*	0.56*	0.30*
5. ITG						0.59*	0.54*
6. IAS							0.51*
7. ISG							
Mean	6.40	5.67	5.30	7.45	7.13	6.42	5.45
sd	0.69	0.84	1.09	1.28	1.30	1.43	1.61

Note. * Significant Correlation - $p < 0.05$. Note: IAT = Individual Attraction for the Task Group; ITG = Integration for the Task group; IAS = Individual Attraction for the Social Group; ISG = Integration for the Social Group.

SEM

The measurement model (Step 1) presented acceptable indexes [$X^2 (67) = 612.645$; $p = 0.001$; $X^2 / gl = 2.16$; CFI = 0.91; GFI = 0.90; TLI = 0.91; RMSEA = 0.06; -I.C. 0.05-0.07]. The quality of the local adjustment and the internal reliability of items were also confirmed, with all trajectories obtaining significant factorial loads ($p < 0.05$) and greater than 0.50. MEV values were acceptable for the convergent validity of the measurement model in three factors (Competence = 0.53; Relatedness = 0.50; Task Cohesion = 0.51). Autonomy (MEV = 0.42) and Social Cohesion factors (MEV = 0.45) were below the recommended level, but presented values

close to 0.50. Then, the hypothetical model was analyzed (Step 2). The model tested (Figure 1) showed sufficiently acceptable fit indicators [$\chi^2(39) = 217.91$; $p = 0.001$; $\chi^2 / df = 3.01$; CFI = 0.91; GFI = 0.92; TLI = 0.90; RMSEA = 0.08-1.C. 0.07-0.09].

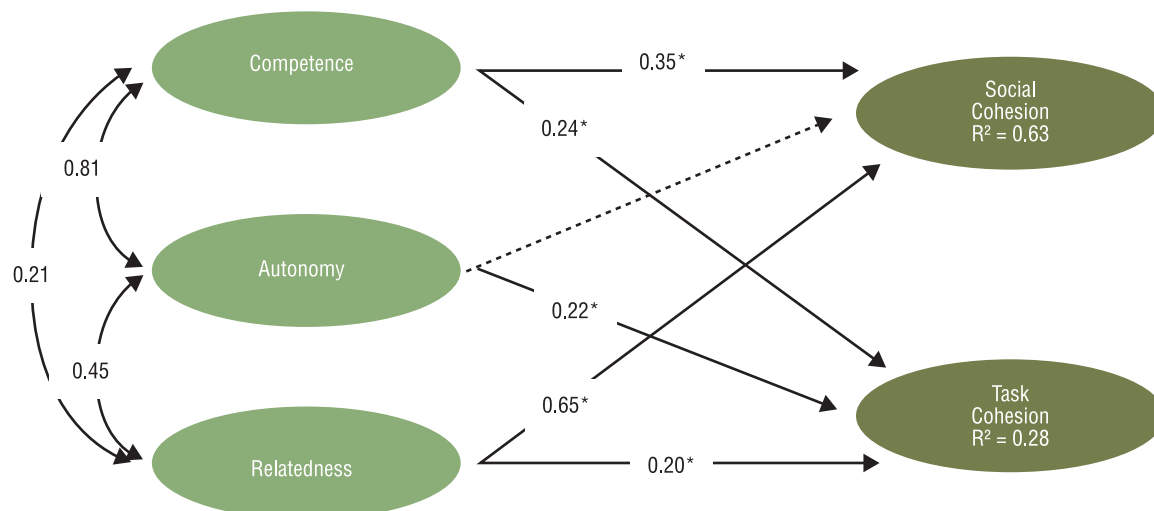


Figure 1. Structural model of the association between BPN satisfaction and group cohesion of futsal players. Note: Only latent variables are presented in the model to facilitate the visualization of results.
* $p < 0,05$

Latent variables Social Cohesion and Task Cohesion were explained in 63% and 28%, respectively, by the satisfaction of three BPNs (Figure 1). Specifically, BPNs of Competence ($\beta = 0.24$), Autonomy ($\beta = 0.22$) and Relatedness ($\beta = 0.20$) showed positive and moderate direct effect with Task Cohesion, indicating that each increase of 1 standard deviation in the satisfaction of BPNs of Competence, Autonomy and Relatedness, there is an increase of 0.24, 0.22 and 0.20 standard deviation. This finding reveals that, in the context of high-performance sports, the more the athlete feels competent, with good social relations and autonomy to control his own actions within the team and in the sporting context, the more involved with team goals and the greater the likelihood of making friends within the group.

In addition, BPNs of Competence and Relatedness presented moderate ($\beta = 0.35$) and strong effect ($\beta = 0.65$), respectively, on the Social Cohesion of athletes, indicating that at each increase of 1 standard deviation in the unit of BPN satisfaction, there is an increase of 0.35 and 0.65 standard deviation, respectively, in the Social Cohesion perception of athletes. Only BPN of Autonomy did not present significant effect ($p > 0.05$) on Social Cohesion. This finding demonstrates that the satisfaction of BPN of Competence and especially Relatedness favors social interaction and the creation of social bonds within the team. It is noteworthy that these two BPNs have greater importance for social cohesion, while autonomy is important only for task cohesion.

DISCUSSION

This study investigated the association between BPN satisfaction of the self-determination theory and perception of group cohesion among high-performance futsal players. Although this is a subject already addressed in literature, it still lacks scientific findings regarding the effects of the satisfaction of each BPN alone on the group dynamics in high-performance sport, since studies found in literature analyzed BPN as a whole. The main findings revealed that the satisfaction of the three BPNs is associated with Task Cohesion, whereas only BPNs of Relatedness and Competence were associated with Social Cohesion. In this perspective, the results of this research corroborate previous studies¹⁶⁻¹⁸, when confirming the positive association between BPN satisfaction of the self-determination theory and the perception of group cohesion in the sport context.

Satisfaction of the three BPNs showed moderate effect on Task Cohesion (Figure 1). The results demonstrate that when athletes feel their three BPNs satisfied, their respective perceptions of union are reinforced, leading to greater involvement with collective tasks and goals^{5,6}. According to SDT, the factors that lead to the satisfaction of each of the BPNs are strongly related to the scenario in which the subject is inserted¹². Thus, these findings show that the context of high-performance sport seems to be a factor that encourages the satisfaction of the three BPNs, which, in turn, seem to favor cohesion for the achievement of collective tasks.

Nascimento Junior et al.¹⁶ found similar results when analyzing the mediating role of BPN satisfaction in the association between perfectionism traits and the cohesion of futsal athletes. The authors verified that the satisfaction of BPNs increases the effect of adaptive perfectionism on the cohesion for task to be achieved. On the other hand, Erikstad et al.¹⁸ analyzed the association between BPN satisfaction and group cohesion of young soccer players, verifying that Task Cohesion was not associated with BPN satisfaction. The findings of the present and previous studies show that BPN satisfaction seems to be an important factor for Task Cohesion only in high-performance sport; however, only the present study analyzed the isolated effect of each BPN on Task Cohesion.

Regarding Social Cohesion (Figure 1), only the satisfaction of BPNs of Relatedness and Competence showed association, evidencing that the feelings of connection and the intention to cultivate affective bonds with the team components and the capacity to perform the proposed tasks are important factors for the creation of bonds and social interaction within the team. This finding corroborates the results found by Nascimento Junior et al.¹⁶ with adult futsal players and Erikstad et al.¹⁸ with young soccer players, who found positive association between BPN satisfaction and Social Cohesion. However, when analyzing the isolated effect of each BPN, the present study revealed that BPN of Autonomy does not seem to be an important factor for the Social Cohesion of high-performance futsal athletes. This finding can be explained by the fact that the need for

Autonomy is mainly associated with work and the performance of tasks²⁶. This BPN is satisfied as supervisors and bosses make the daily tasks of workers significant and important²⁶. In sport, it is essential that coaches turn daily training into meaningful tasks for the athlete to feel autonomous and therefore optimize performance.

It is noteworthy that BPN of Relatedness proved to be important for both Group Cohesion dimensions (Figure 1). According to SDT, the need for relationship is about being attracted, connected and supported by social peers in the context in which the individual is inserted¹². This need is especially important in collective sports, since collective modalities require cooperation and interaction among members to perform tasks. In this way, frustration in this aspect can be pointed out as one of the causes for abandonment of the team and even the career. Although the context of high-performance sport prioritizes performance to the detriment of development and maintenance of social relations, the findings of the present study indicate that the need for Relatedness seems to be more important for individual and collective involvement with social aspects (Social Cohesion) than involvement with team tasks and goals (Task Cohesion).

This result is in line with results obtained by Gonzales, Borges and Sfalcin²⁷, who found that interpersonal conflicts with teammates, coaches and supporters are among the reasons that lead professional players to abandon futsal practice. Caregnato et al.²⁸ also found that the main reasons that lead young athletes to abandon futsal practice are relationship problems.

BPN Competence was also important for both Group Cohesion dimensions (Figure 1). Although it is BPN with more task-oriented characteristics, since it refers to the feeling of ability and effectiveness in performing activities at varying levels of difficulty^{12,13}, the findings of this study indicated that Competence presented greater effect for Social Cohesion, which is an unexpected result, especially in high-performance sports. Taylor and Bruner²⁹ found that BPN satisfaction is related to goal setting in young soccer players, demonstrating that BPN satisfaction can be an important interpersonal mechanism for the development of greater personal involvement, attention and effort in relation to challenges, that is, task-oriented aspects.

Autonomy, which refers to the perception that behavior and its results are not influenced by external agents, but caused by the individual itself^{12,14}, was important only for Task Cohesion (Figure 1), indicating that the more athletes have the feeling of independence to act according to their own actions, the greater their involvement with team tasks and goals. Thus, it could be concluded that the satisfaction of BPN of Autonomy of high-performance athletes is a factor that favors individual and collective involvement with tasks.

Although the findings of this study point to important information regarding the isolated effect of each BPN on Social Cohesion and Task Cohesion of high-performance futsal players, some limitations should be highlighted. First, a single sport modality was investigated, which im-

paired generalizing the results to all sports, while providing implications regarding the association between BPN satisfaction and Group cohesion to other high-performance team sports. Another important limitation refers to the cross-sectional design of this study, which does not allow causality inferences. Perhaps longitudinal studies could be able to point out the causal nature of associations between BPNs of the self-determination theory and group cohesion. In addition, although investigations relating group cohesion issues and BPN are still recent, especially when analyzing the isolated effect of each BPN on group cohesion, there is a restriction on the deepening of discussions of results found. Thus, future studies should investigate such associations through longitudinal or prospective research design. In addition, other sports modalities should be investigated, as well as female athletes and the use of multigroup and multilevel analysis, and latent mean differences, in order to better understand the complex relationships between these variables in different groups.

CONCLUSION

It could be concluded that the satisfaction of BPNs plays an important role in the perception of group cohesion among high-performance futsal players, proving to be potential facilitators for team union for collective performance, achievement of goals and relationships within the group. It is noteworthy that the satisfaction of the three BPNs was found to be involved in Task Cohesion, while only the satisfaction of BPNs of Relatedness and Competence were important for Social Cohesion. For practical application, these findings provide empirical support for interventions aimed at the satisfaction of BPN as a means of promoting better collective involvement and teamwork in high-performance sports. Such interventions should be performed in conjunction with coaches, psychologists, family members and directly with athletes, teaching them about the role of psychological variables in their performance, and providing satisfaction for their BPNs.

COMPLIANCE WITH ETHICAL STANDARDS

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Ethical approval

Ethical approval was obtained from the local Human Research Ethics Committee – Federal University of “Vale do São Francisco” (Univasf) (protocol No. 248.363/2013) was written in accordance with standards set by the Declaration of Helsinki.

Conflict of interest statement

The authors have no conflict of interests to declare.

Author Contributions

Conceived and designed the experiments: JRANJ, LF, AAS. Performed the experiments: JRANJ. Analyzed data: JRANJ, AAS, LSF, CTLG. Contributed with reagents/materials/analysis tools: JRANJ, MPG, LSF, DVC. Wrote the paper: JRANJ, CTLG, AAS, LSF, MPG, DVC, LF.

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