

Transcontextual model application in the prediction of veteran judo athletes' life satisfaction

Authors' Contribution:

- A** Study Design
- B** Data Collection
- C** Statistical Analysis
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Abstract

Background and Study Aim:

Despite recognised benefits of regular physical activity for health, the percentage of individuals linking with a physical activity practice sufficient to confer health benefits is low. The aim of current work is knowledge about effects of an extension of the motivation trans-contextual model application, specifically in the prediction of life satisfaction by veteran judo athletes.

Material and Methods:

It was used a sample of 99 Portuguese veteran judo athletes of both genders, aged between 30 and 76 years ($M = 42.61 \pm 9.75$), where through questionnaires were measured: basic psychological needs satisfaction, motivation, planned behaviour variables and life satisfaction.

Results:

The structural equations model showed that autonomy perception positively and significantly predicts autonomous motivation. In its turn it positively and significantly predicts intentions.

Conclusions:

Life satisfaction is positively and significantly predicted by intentions. Results authorise to emphasise the importance of fostering autonomy, since this will favour autonomous motivation, promoting a higher behavioural control over the practitioners' intentions, thus generating a higher life satisfaction.

Keywords:

basic psychological needs satisfaction • motivation • planned behaviour • self-determination theory • structural equations model

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Transcontextual Model (TCM)

– the main point of the TCM focuses on explaining the process by which motivation in the educational field can be transferred to external contexts.

Non-competitive – *adj.*

used for describing a sport or activity that does not involve any element of competition [76].

Physical activity – *noun*

exercise and general movement that a person carries out as part of their day [76].

Physical education (PE) – *noun*

gymnastics, athletics, team sports and other forms of physical exercise taught to children at school [76].

Intrinsic motivation – *noun*

motivation to achieve a goal for reasons of pride, enjoyment and self-worth [76].

Extrinsic motivation – *noun*

motivation to achieve a goal out of a desire to win a prize [76].

Amotivational syndrome – *noun*

a psychological condition characterised by a loss of the motivation to carry out socially accepted behaviours and tasks, usually associated with the use of marijuana [76].

Recreational – *adj.* done or used for pleasure or relaxation rather than work [76].

A Likert scale – *is*

a psychometric scale commonly involved in research that employs questionnaires. It is the most widely used approach to scaling responses in survey research, such that the term (or more accurately the Likert-type scale) is often used interchangeably with a *rating scale*, even though the two are not synonymous [77].

INTRODUCTION

Sport presents itself as a socially implanted context in all countries. It is an educational and socialising environment, which gives to practitioners from a very young age to veterans a whole set of ethical and moral values that can shape the personality, the way of being, the decision making or even personal ambition [1]. This sports participation ambition, achievement or perceived success can, in many cases generate professionals of excellence in the most diverse areas, being sport one of them.

This study focuses mainly on veteran sports context, seeking to investigate based on the Transcontextual model the phenomenon of sports participation of this collective in the sport of judo. Our society is constantly changing, and in the last decades has been observed an increase in life expectancy, accompanied by an increase in the percentage of individuals above 35 years old, participating in competitive and non-competitive physical activities [2].

Despite recognised benefits of regular physical activity for health, the percentage of individuals linking with a physical activity practice sufficient to confer health benefits is low [3]. The degenerative effects of the human being ageing process, described in detail by the American College of Sports Medicine [4], are known.

Regarding veteran sport, it corresponds to the sport practised by athletes who exceed 35 years old and continue to compete for sporting events, although in many modalities the term used to classify these athletes is “masters athletes”. However, we can find participation levels in veteran classes at lower ages, such as swimming, from 28 years old, or in other modalities, from the age of 30, such as triathlon or judo. The veteran participation in sport in Portugal has evolved in a number of federated effective, indicating growth from 2002 to 2009 of 1500%, unlike the younger ones, which only doubled, however, the ratio of veteran participation by gender centres in 1:7 in favour of men [5]. In the modality sport of judo, in Portugal, in 2016, the number of veteran athletes focuses on 1294 men and women, with a record of competitive participation in the national championship of 100 athletes [6].

It is important to note that veteran athletes, as a rule, train and compete throughout their lifetime [7], making the motivation to delay

ageing and to have a higher life quality, one of the highest motivations of this athlete collective [8-10].

This greater or lesser competitive longevity of athletes, professionals or amateurs, drags us to a reflection field that is related to the quality of life, very linked to well-being. The notion of well-being is heavily dependent on health aspects, but equally dependent on psychological aspects such as self-esteem, perceived success, goal objectives, or achievement levels, productivity and the athlete performance, being life satisfaction one of the main indicators of the subjective well-being [11]. It is vitally important that former athletes, many of them current veteran athletes, continue to find in the sport a contextual dimension that provides them with a healthy lifestyle and high satisfaction with life.

Transcontextual model suggests an original contribution to knowledge, illustrating the judo veteran athlete’s behaviour, interpreting the self-determination theory, contrasting with the hierarchical motivation model, as well as with the planned behaviour theory, trying to predict levels of life satisfaction, demonstrating it through a structural equation model.

The main point of the trans-contextual model focuses on explaining the process by which motivation in the educational field can be transferred to external contexts [12]. This model has been widely applied in physical education contexts, analysing how the perceived support for classroom motivation can influence motivation to perform the physical activity during class as well as in the recreational behaviours evidenced in the practice of real physical activity outside of school [12, 13-15]. The strength of this model lies in the integration of different motivational theories [16, 17], such that an explanation is a predicted complement to the motivational processes that are theoretically unexplained by each component [18, 19]. Specifically, trans-contextual model integrates self-determination theory [20-23], the hierarchical model of intrinsic motivation and extrinsic motivation [24] and planned behaviour theory [25].

Self-determination motivational theory [20-23] explains that motivation is a continuum characterised by distinct self-determination levels that, from highest to lowest, are intrinsic motivation, extrinsic motivation, and amotivation

(amotivational syndrome). Therefore considering that the inner dimension of motivation was an autonomous motivation for the involved agent, whereas the outer dimension of motivation made it a controlled motivation. The autonomous motivation of self-determination theory operates in three generality levels: global, contextual and situational. For this author, global-level motivation reflects a generalised disposition to be autonomously motivated and influences behaviour in a number of contexts [24]. Contextual-level motivation is a motivation to engage in behaviours in a given context, such as physical education, or recreational or competitive physical activity. Motivation at the situational level refers to autonomous motivation directed to specific confrontations of a certain behaviour, for example, the competition, being at the contextual level, therefore, where the transfer takes place between the contexts.

More recently, other authors [26, 27] define self-determination theory as an empirical theory of human motivation and personality in social contexts that distinguishes between self-determined and non-self-determined motivation. These types of self-determination are concretised in amotivation (absence of intention to act), external regulation, introjected and identified (determined by rewards and/or external agents) and intrinsic regulation (pleasure in performing an activity).

According to another author [28], in self-determination theory framework there are three needs for psychological growth and well-being, these are the needs for psychological autonomy, personal competence and social bond, seen as the prerequisite for the ideal functioning of these integrative processes of the organism. These needs are defended by the basic psychological needs theory, which assumes that these three basic needs exist for the development and maintenance of psychological health and/or personal well-being [29].

Beginning by characterising the three basic psychological needs, we can say that the need of autonomy perception is defined as the imperative of actions and decisions in accordance with personal values and with a high level of reflection and awareness [30]. According to other authors [31], the autonomy concept is linked to the organism desire or will to organise experience and self-behaviour, as well as to integrate them

into the sense of self. As aptitude, autonomy is the ability to choose what seems to be the most appropriate decision without any external pressure [29], and also the ability to initiate tasks or make decisions, volitional control and the consequences assumption of self-behaviour [32]. According to Deci and Ryan [23], the several studies about the autonomy perception reveal that it is related to higher intrinsic motivation, higher satisfaction, and greater well-being.

In turn, the need for personal competence perception is related to the environment adaptation referring to learning in general and also to cognitive development. This need embodies, from the search for survival, the execution of practical activities, exploration of the environment, to the competence in an effective social participation [23, 30]. Simplifying, it is the ability to perform actions with the certainty that the result is the one expected or desired [29], referring to a personal feeling of effectiveness [32].

At last, the need of social bond perception comes from seeking relationships with other people, groups or communities, in search of the activity of loving and being loved [30]. From this need, also arises, concern, responsibility, sensitivity and support in affective relationships [32]. This need is the feeling that one can rely on collaboration and acceptance of people considered important [29] and is essential for the acquisition of social regulations (norms, rules and values) because it is through bonds with others that learning occurs [23].

Reflecting on the role of satisfaction in basic psychological needs in the trans-contextual model, the autonomy support provided by other significant people in sporting context indicates the athlete that the activities in which he/she participates offer an opportunity to satisfy basic psychological needs.

Transcontextual model also applies the theory of planned behaviour postulates [25] to explain how the types of self-determined motivation (contextual and real) form the social-cognitive basis for judgments about future situational behaviours. Therefore, the trans-contextual model proposes that autonomous motivation for recreational physical activity is related to attitudes, subjective norms, and perceived control perception over the behaviour [12, 15]. From the

Ajzen theorisation [25, 33] attitudes, subjective norms and behavioural control perception are related to the intentions that reflect the amount of effort or intensity that an individual will invest to pursue future results, to engage for example in physical activities, or participation in the competition.

Other authors [34] found that individuals tend to align their motivation levels, particularly adaptive, through similar and labelled contexts generating “trans-contextual effects.” This alignment and transfer process have also been recognised and supported empirically in other areas [34-36].

The current model extends the trans-contextual model to other contexts because it allows a formal test of these mechanisms, admitting as consequences their behaviours or satisfaction, such as life satisfaction and affections production. We will seek to highlight the conceptual basis and fundamental hypotheses of the trans-contextual model (TCM) and provide details of how to apply this model in our study, incorporating basic psychological needs, resulting in life satisfaction in veteran athletes.

Life satisfaction construct is understood as a judicial process in which individuals globally evaluate the quality of their lives based on their criteria. Authors [37], report that life satisfaction is a cognitive judgment process. Effectively, we can characterize it as being a cognitive component of subjective well-being, consisting of a global judgment made by the individual, which focuses and turns to more positive feelings than negative ones, which means, it is a positive evaluation of life’s events and circumstances, and can be subdivided into several domains, such as job satisfaction, love, family and friends [38, 39].

According to the authors [40], this concept is still considered as a subjective dimension of life quality, alongside with happiness and well-being. The life satisfaction refers to the subjective judgment that the individual makes about his life quality, looking at his whole life history and basing on the factors that are indispensable for him to feel happy and satisfied [39].

Thus, when addressing the life satisfaction factor, it is important to take into account that this may refer to specific aspects, such as work, family, leisure, health, economy, among others. This is a psychological state that is closely related to

well-being, rather than objective assessments of personal life quality.

Reflecting now on the veteran competing population, we present some studies that have investigated the same integral variables of the Transcontextual Model and life satisfaction, which we propose in our study. It is known the degenerative effects of the human being ageing process, described in detail by the American College of Sports Medicine [4]. However, it is very interesting to note that veteran athletes typically train and compete for practically their entire life [7], wherefore the motivation for delaying aging and have a higher life quality, could be one of the highest motivations of this type of athlete, indicators obtained in various study’s [8, 9, 41, 42].

In veteran athlete’s case, motivation must also be considered a psychological determinant that may interfere with the athlete’s athletic performance. According to the authors [9, 43], these athletes motivations are mainly intrinsic, although the extrinsic motivations, health reasons, taste for practice, social relations and the competition itself are also very important. Other authors [44] have analysed practitioners of six different sports, aged between 29 and 77 years old, where it was observed that they had a high perception of their ability and mostly showed an intrinsic motivation, regardless of the type of sport. Studying specifically veteran athletes who regularly trained and competed in athletics, Da Silva [43] found that their motivations were fundamentally intrinsic, although extrinsic motivations, health reasons, social relations and competition were also important.

When performing studies inherent to the self-determined level due to a series of training habits and athletic history, veteran athletes revealed high levels of intrinsic motivation, moderate extrinsic motivation and almost null of amotivation [45], because for these athletes, the most important part of their sports practice is the satisfaction of overcoming their limits during training and only then, overcoming opponents in competitions, waiting for a medal, or even a record [42, 46].

In a study conducted in veteran judo athletes [47], the authors obtained high levels of basic psychological needs, with the main emphasis on social relations perception, a high autonomous

motivation, as well as reduced values in terms of controlled motivation and amotivation. In well-being indicators, the level of life satisfaction and positive affects revealed high levels and lower negative affects, being these last significant predictors of life satisfaction.

In the same line of investigation [2], but using several modalities, have obtained higher values in autonomous motivation, particularly the intrinsic motivation dimension, as well as social relations perception. The level of life satisfaction was high, as well as the positive affects production and a lower tendency for negative affects, also being these predictors significant of life satisfaction. In these last two studies, self-determination variables explained between 17% and 20% of life satisfaction variance, which when associated with the produced effects in the competitive practice explain 31% to 38% of the variance.

When comparing the gender in veteran athletes [10], observed that there were no significant differences as to the forms of self-determined motivation. However, the female athletes presented significant differences in their favour, in the satisfaction of basic psychological needs.

Motivation determines the meaning, intensity and persistence of behaviours, explaining why people do or participate in certain activities, with what determination and how much time they invest in them [48]. Motivation is closely linked with the intentional dimension of behaviour and is a determinant construct

to analyse in the promoting physical activity context [18] particularly in veteran sports [2, 9]. Physical activity practice is assumed as an intentional behaviour that is directly affected by motivational antecedents [17], wherein that line the motivation trans-contextual model has been developed [15]. The current study will examine whether the model can be replicated in this culturally unique context, as well as extend it to include additional constructs to the self-determination theory [22].

The aim of current work is knowledge about effects of an extension of the motivation trans-contextual model application, specifically in the prediction of life satisfaction by veteran judo athletes.

MATERIAL AND METHODS

Participants

The study sample consisted of 99 Portuguese veterans judo athletes of both genders, aged between 30 and 76 years (M = 42.61 ±9.75), of whom 84.8% (84 individuals) were male, and 15.2% (15 individuals) were female, competitors of several weight categories. The sampling type used for the sample selection of the current study was not random, since it is not based on a probabilistic basis, being inherent to data collection an intentional approach to subjects with certain specific characteristics [49].

This study was approved by the doctoral commission of the University of Extremadura,

Table 1. Descriptive statistics, correlation and reliability analysis.

Variable	Likert scale	Statistic indicator			Corelations variables									
		M	SD	α	2	3	4	5	6	7	8	9	10	
Autonomy perception	1-5	4.16	0.76	.88	.81**	.57**	.67**	-.12	.32**	.23*	.45**	.27**	.37**	
Competence perception	1-5	4.24	0.54	.79		.60**	.58**	-.08	.41**	.22*	.38**	.27**	.37**	
Social rel. perceptions	1-5	4.55	0.49	.78			.37**	-.21*	.32**	.32**	.10	.51**	.33**	
Autonomous Motivation	1-7	6.15	0.76	.90				-.11	.40**	.17	.42**	.25*	.36**	
Controlled motivation	1-7	1.89	0.88	.79					-.28**	-.20*	-.20*	-.14	-.21*	
Attitudes	1-7	6.45	0.49	.84						.04	.30**	.42**	.24*	
Subjective norms	1-7	6.34	0.92	.92							.06	.29**	.13	
Control perception	1-7	5.45	1.19	.78								.15	.10	
Intentions	1-7	6.46	0.66	.70									.33**	
Life satisfaction	1-7	5.26	1.13	.92										

M mean, **SD** standard deviation; *p≤0.05; **p≤0.01

in a document dated January 22, 2016, in compliance with the ethical criteria required by this body. This was a cross-sectional study that will focus on testing the trans-contextual model through a structural equation model application, following reference authors' recommendations [50, 51]. All participants were duly informed of the purpose of the study, and individual informed consent was signed.

Instruments

Basic psychological needs. To measure basic psychological needs satisfaction, it was applied the Portuguese version of the basic psychological needs exercise scale (BPNES) [52] validated by the Portuguese language [53]. This scale consists of 12 items distributed in 3 dimensions that reflect the basic psychological needs of the self-determination theory: autonomy, competence perception and social relations perception, being each dimension composed of 4 items that can be classified taking into account a Likert-type scale, between 1 (totally disagree) and 5 (totally agree). By confirmatory analysis [54] proved the adequacy of the adaptation made. In the current study, the measurement model revealed acceptable adjustment values to the data: $\chi^2 = 50.95$, $p \leq 0.01$, $\chi^2/g.l. = 4.63$, CFI (Confirmatory Fit Index) = 0.98, NNFI (Non-normed Fit Index) = 0.95, SRMR (Standardized Root-Mean-Square Residual) = 0.03, RMSEA (Root Mean Square Error of Approximation) = 0.02, obtaining the following internal reliability indexes: autonomy perception ($\alpha = 0.78$) competence perception ($\alpha = 0.71$), social relation perception ($\alpha = 0.78$).

Motivation. To measure motivation, it was applied the Behavior Regulation in Sport Questionnaire (BRSQ) [55], from the original questionnaire [56]. This questionnaire consists of 24 items that are answered on a 7 levels Likert scale type, ranging from 1 ("not true for me") to 7 ("totally true for me"). The items are grouped, afterwards, into 6 factors (with 4 items each), which reflect the types of the motivation underlying to the motivational continuum of self-determination theory (SDT) [21, 23]. For the current study, it was used the validated version of the preliminary form for the Portuguese population [57], using a confirmatory factorial analysis in a sample of 623 football athletes, presenting their measuring model (6 factors with 3 items each). In the current study were obtained the following data adjustment values:

$\chi^2 = 177.366$, $p \leq 0.01$, $\chi^2/g.l. = 0.32$, CFI = 0.97, NNFI = 0.95, SRMR = 0.04, RMSEA = 0.07, as well as the internal reliability indexes: amotivation ($\alpha = 0.81$), autonomous motivation ($\alpha = 0.88$), controlled motivation ($\alpha = 0.89$).

Planned Behaviour. In order to measure the planned behaviour variables associated with sports practice (intentions, attitudes, subjective norms and control perception), it was applied the questionnaire already applied by other authors [58-60]. This is formed by 17 standard items, validated for the Portuguese language [59], elaborated from Ajzen's guidelines [61], divided by four dimensions, using a seven-point Likert scale to proceed with their classification.

In this study, the measurement model revealed acceptable data adjustment values: $\chi^2 = 200.68$, $p \leq 0.01$, $\chi^2/g.l. = 3.40$, CFI = 0.94, NNFI = 0.92, SRMR = 0.05, RMSEA = 0.06 obtaining the following internal reliability indexes: Attitudes ($\alpha = 0.79$), subjective norms ($\alpha = 0.79$), control perception ($\alpha = 0.73$), intentions ($\alpha = 0.71$).

Life satisfaction. To measure life satisfaction, it was used the life satisfaction scale [37]. This consists of 5 items and consists of indicating, through a 7-point Likert scale, which varies between totally disagree (1) and absolutely agree (7), the satisfaction degree according to each item. The study [62] of the validation process of the Portuguese version of Satisfaction with Life Scale (SWLS) [63], through the confirmatory factorial analysis, the adjustment quality indexes were considered adequate.

In the current study, the measurement model revealed acceptable data adjustment values: $\chi^2 = 24.16$, $p \leq 0.01$, $\chi^2/g.l. = 4.83$, CFI = 0.99, NNFI = 0.98, SRMR = 0.02, RMSEA = 0.07, with an internal reliability index: life satisfaction ($\alpha = 0.87$).

Structural equations model

In order to analyse the relationships between the variables belonging to the planned model (autonomy perception, autonomous motivation, intentions and perceived life satisfaction), it was used the structural equations model.

Observational data fit the established indicators, so the proposed model can be accepted as adequate [50]. In the same way, the contribution of each of the factors for the prediction of other

variables was examined through the standardised regression weights. The “t” value associated with each weight was taken as a contribution measure so that values higher than 1.96 are considered significant.

Measurement model

In order to perform the measurement model analysis and to test the structural equations model (SEM), it was reduced the number of latent variables per factor. This process is especially advisable when the sample size is not particularly large compared to the model variables number [24, 64, 65]. This reduction can be made by combining the items in pairs. Thus, half of the first three items of each subscale were measured to form the first item block, in the second half of the items proceeded in the same way for the second item block, and so on until the last. It proposed [64] the item pairs use because the results are more reliable, tend to be distributed more normally, and because the ratio of the variables number measured in the model and the study participants' number is reduced by half.

It was considered a fit coefficients series to evaluate the measurement models goodness of fit with the empirical data. Therefore, based on the contributions of different authors [66-68], fit indexes or goodness of fit indexes that were considered to evaluate the goodness of the measurement model were: χ^2 , χ^2/df , RMSEA, RMSR (Root Mean Square Residual) and incremental indexes CFI (Confirmatory Fit Index), IFI (Incremental Fit Index) and TLI (Tucker Lewis Index). This goodness of fit indexes are considered acceptable when χ^2/df is less than 5, incremental indexes (CFI, IFI, and TLI) are greater than .90 and error indexes (RMSEA and RMSR) are less than .08 [50, 69]. The indexes obtained after the analysis were: $\chi^2 = 548.228$, $p < .001$; $\chi^2/df = 3.26$; CFI = .93; IFI = .93; TLI = .91; GFI (Goodness-of-Fit Index) = .93; RMSEA = .59; RMSR = .46. The model discriminant validity was also examined, respecting that the correlation between the latent variables, attenuated by the measurement error (± 2 times the measurement error), was less than 1.0.

Procedures

In the following phase, it took place a sports centres selection, such as clubs and associations, attending to a sample for convenience [49]. For the information collection, we put ourselves in

direct contact with veteran athletes to request their collaboration in the study, requesting, after their consent, the signing of informed consent.

The definitive questionnaire administration, which agglutinated the previously described scales, was carried out in the presence of the principal investigator, to briefly explain the objectives and structure, as well as the filling form. During the filling process, the principal investigator was available for any problem that might arise. The approximate filling time was about thirty minutes.

Data analysis

It was carried out an analysis of normality assumption throughout the Kolmogorov Smirnov test, having obtained a normal distribution of data in the sample. Secondly, it was performed a descriptive correlation analysis of all study variables. In third place, to prove the relationship between the proposed variables, the two-step method [70] was applied. In the first step, it was tested the measurement model construct validity through a confirmatory factorial analysis (measurement model). The items that composed the latent factors were divided into two random groups, performing the said analysis based on the measures observed in the latent constructs that freely correlate [70]. In a second step, it was carried out a structural equation model with which it was analysing the predictive relationships between the analysed variables. All analyses were developed through the statistical programs SPSS 21.0 and EQS 6.1.

RESULTS

Descriptive analysis and correlation of all variables

Respecting to the self-determination theory variables, in basic psychological needs, social relation perception was the most punctuated variable, obtaining a value of 4.55, autonomy perception presented a mean of 4.16 and competence perception obtained an average of 4.24. In the motivation field, autonomous motivation was valued with 6.15 points; controlled motivation obtained an average of 1.89. In the planned behaviour theory variables, intentions were the most valued variable by veteran athletes getting an average value of 6.46. Attitudes variable presented a mean of 6.45, in the subjective norms variable an average of

6.34 was obtained, and in control perception, it was obtained a mean of 5.45. Life satisfaction presented a value of 5.26 points out of 7 (Table 1).

Correlation analysis revealed that the variables of autonomy perception, competence perception, social relationship perception, the autonomous motivation variable, attitudes variables and life satisfaction correlated positively and significantly with each other. Planned behaviour variables, namely subjective norms, control perception and intentions presented lower correlations with the other variables. Controlled motivation variable revealed negative and significant correlations with the other variables, except for intentions variable, which despite the negative tendency did not present significant values (Table 1).

Structural equations model

Therefore, according to previous indications, the results showed that the measurement model was adequate. The goodness model test showed the following adjustment indexes: $\chi^2 = 71.566$, $p < .001$, $\chi^2/df = 1.74$, CFI = .94; IFI = .94; TLI = .92; RMSEA = .075; SRMR = .067; RMR = .074. In Figure 1 it is observed that autonomy perception positively and significantly predicts autonomous motivation. This, in turn, positively and significantly predicts intentions. Life satisfaction is positively and significantly predicted by intentions.

DISCUSSION

There is little research, up to date, that has analysed the relationships proposed outside the physical education scope. The majority of the trans-contextual model studies have focused on proving that the motivation developed in students, based on autonomy in physical education classes, can be transferred by these to the practice of diverse physical activities in recreational context. Investigations also reveal excellent indicators regarding the autonomy given by the family representatives to the practitioners, in the sense of being a predictor of adherence to the physical or sports activity practice. Most of the studies carried out within veteran sport athletes have focused on proving some of the relationships proposed by the self-determination theory. This study will allow knowing in greater measure the motivational mechanism that takes veteran athletes to maintain themselves in the physical sport practice.

The descriptive results obtained in this research, in the self-determination theory variables, specifically in basic psychological needs, social relation perception was the most punctuated variable, followed by competence perception and autonomy perception, assuming a similar tendency with the studies [2, 47].

In the motivation domain, autonomous motivation was highly valued, corroborating the studies [2, 10, 44-47]. Controlled motivation obtained lower values [45] who found moderate

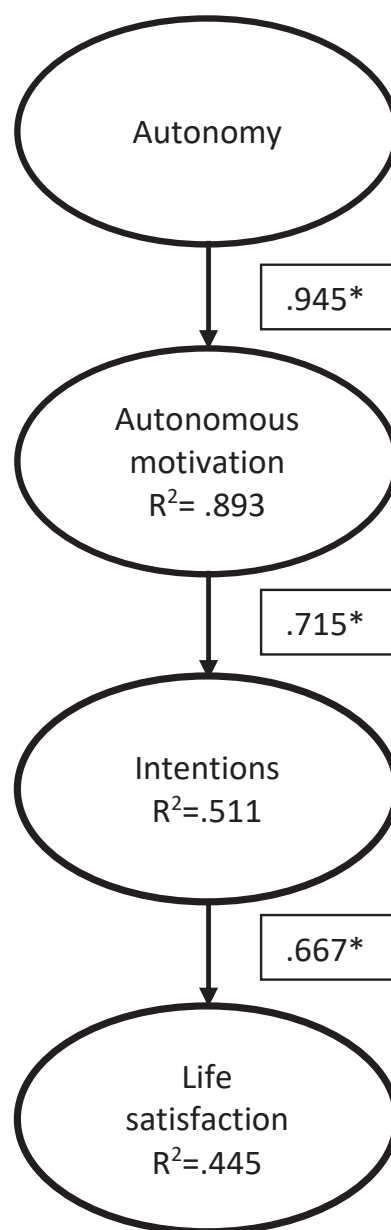


Figure 1. Structural equation model in the trans-contextual model application to veteran judo athletes.

values of extrinsic motivation and almost null of amotivation. In the motivational domain, this study converges with the one [71], who concluded that the veteran athletes presented the two types of motivation, intrinsic and extrinsic.

In the planned behaviour theory variables, intentions were the most valued variable by veteran athletes. This finding seems to respect Ajzen's theorisation [25], corroborated by the studies [58-60], where intentions are presented as the main behaviours predictor, in the way that, intentions reflect the amount of effort or intensity that an individual will invest to pursue future results.

In the life satisfaction variable as a well-being factor in veteran athletes, high values were obtained, such as the findings of studies [2, 47].

Focusing now on the correlation analysis, this revealed that the variables autonomy perception, competence perception, social relation perception, autonomous motivation, attitudes variables and life satisfaction correlated positively and significantly with each other. Planned behaviour variables, namely subjective norms, control perception and intentions presented lower correlations in relation to the other variables. Controlled motivation variable revealed negative and significant correlations with the other variables, except for the intentions variable, which despite the negative tendency did not present significant values. In a global way, these correlational tendencies between variables respect the framework of the trans-contextual model [13], having obtained the authors [2, 47] in their studies, similar results.

Moving on to the interpretation of the structural equation model obtained in our study, this revealed that basic psychological need for autonomy is a predictor of autonomous motivation, an indicator that respects the findings of the studies [34-36], in the way that satisfaction of the basic psychological need for autonomy was a mediator of autonomous motivation in the context of recreational physical activity.

However, the authors [72] observed that basic psychological needs satisfaction of social relations and competence were mediators in the context of the recreational physical activity, although in our study they were not equally

defined as predictors similar to what these authors described.

In turn, autonomous motivation has proved to be an intentions predictor, to which one study [13] point out that the more motivation autonomous types in recreational physical activity practice positively predict attitudes.

Several studies [12, 17, 18, 19] also point out that the more autonomous types of motivation positively predict subjective norms, attitudes, as well as the behavioral control perception, and in turn, they exert a predictive effect on attitudes, as proposed in Ajzen's theorization [25]. This effect was not observable in the structural equation model obtained considering the indicators of the literature [50, 51], however, that with the increase of the sample the values would improve substantially and hypothetically a valid model could be obtained even more complete.

Life satisfaction variable was predicted by the intentions, respecting the original model proposed [25] with similar results in the studies [58-60], where intentions are presented as the main predictor of behaviours, in the way that intentions reflect the amount of effort or intensity that an individual will invest to pursue future results.

The authors of one study [15] also point out that global satisfaction acts as a mechanism by which autonomous motivation in the sports context can promote autonomous motivation outside this context, being an excellent indicator of a subjective well-being feeling of this collective formed by veterans' judokas.

In our opinion, the achievement of these results seems to meet a greater need for autonomous perception by the veteran judokas as age increases, leaving perceived competence and social relations to be determined, since the accumulated experience over the years will give them solid support for their behavioural performance both in training and in competition. Autonomy perception is defined as the imperative of actions and decisions in accordance with personal values and with a high level of reflection and awareness [30]. According to one study [31], the autonomy concept is linked to the desire or will of the organism to organise experience and the behaviour itself, as well as to integrate them into the sense of self. As aptitude,

autonomy is the ability to choose what seems to be the most appropriate decision without any external pressure [29] and also the ability to initiate tasks or make decisions, volitional control and consequences assumption of the behaviour itself [32, 73]. According to the study [23], the several studies about autonomy perception reveal that it is related to higher intrinsic motivation, higher satisfaction, and greater well-being. This tendency toward basic psychological needs satisfaction as predictive motivation mechanisms and consequently well-being has been shown to be identical in physical activities practitioners of maintenance or recreational with upper ages [74].

As limitations of this study, it should be noted firstly that because it is a correlational study, it is not possible to establish causal relations even though it provides an explanatory model that allows a greater and better understanding of the existing relationship between the different variables analysed in the current study. It is also pointed out the problem of equivalent models that present structural equations technique [75] which assumes that the presented model in this study would not be more than one possible.

In a perspective of improving future studies, the fact that we apply only questionnaires, it would be of interest to obtain information based on another methodology that allows data triangulation, either by interviews, or by focus groups, or by training frequency records, among other sources of information. Thus, it would be advisable in the future to carry out longitudinal studies and experimental designs through which certain interventions effect, at the level of psychological needs and/or motivation can be demonstrated, as well as to understand the importance of other significant ones in veteran athletes' perception.

As proposals for practical application, the structural equation model obtained in this research revealed that basic psychological need for autonomy is an autonomous motivation predictor. The results were favourable that it is important for veteran judokas in the sports

practice context, both in training and competition that feel from the coach's side higher autonomy and choice possibility. As strategies, we propose to allow judokas to participate in the tasks selection, taking into account the order of the same, time allocated to each task, work partners, exercises and/or techniques to work. Encourage judokas to express their opinion on how to do the exercises and take their opinion into account.

Self-motivation proved to be an intentions predictor. It is absolutely important to work with veteran athletes on an autonomous motivational basis, as this will lead to desired consequences and in turn to more adaptive behaviours.

Intentions reflect representations for desired states, which we understand that a good objectives formulation will be a promoter way to achieve those same objectives. Of course, in this objectives formulation, it will be extremely important the control perception over behaviours, which requires a careful analysis of the obligations and schedules to be fulfilled by each, such as family or work commitments, so that the individual can perform the training and/or competitions to which is proposed.

Life satisfaction variable was predicted by intentions. The last one worked within the proposals above, will generate as a consequence an adaptive process of an affective nature, life satisfaction, where each veteran athlete may feel with more vigour, spirit, well-being or happiness, certainly generating and proving in others studies cognitive and/or behavioural adaptations.

CONCLUSIONS

Life satisfaction is positively and significantly predicted by intentions. Results authorise to emphasise the importance of fostering autonomy, since this will favour autonomous motivation, promoting a higher behavioural control over the practitioners' intentions, thus generating a higher life satisfaction.

REFERENCES

- Carvalho L, Avelar Rosa B, Carvalho A. Capitalização do valor educativo e social da Ética no Desporto no quadro da sua dimensão europeia e de definição de política de financiamento. *Mafrá: Instituto Luso-Ilírio para o Desenvolvimento Humano*; 2014 [in Portuguese]
- Batista M, Castuera RJ, Leyton Roman M et al. Self-determined motivation and life satisfaction in Portuguese veterans athletes. *Retos* 2017; 32: 124-129
- World Health Organization. *World Health Statistics 2016: Monitoring health for the SDGs*. Geneva: World Health Organization; 2016
- American College of Sports Medicine, American Academy of Family Physicians, American Academy of Orthopaedic Surgeons et al. Selected Issues for the Master Athlete and the Team Physician: A Consensus Statement. *Med Sci Sport Exerc* 2010; 42(4): 820-833
- Instituto do Desporto de Portugal. *Estatísticas do Desporto de 1996 a 2009*. Lisboa: Instituto do Desporto de Portugal; 2011 [in Portuguese]
- Federação Portuguesa de Judo. *Relatório de Actividades e Contas 2016*. Lisboa: Federação Portuguesa de Judo; 2017 [in Portuguese]
- Baker J, Horton S, Weir P. *The masters athlete: Understanding the role of sport and exercise in optimizing aging*. New York: Routledge; 2010
- Sancho AZ, Ruiz-Juan F. Motivaciones de los maratonianos según variables socio-demográficas y de entrenamiento. *Retos* 2013; 24: 50-56 [in Spanish]
- Zarauz A, Ruiz-Juan F. Motivación, satisfacción, percepción y creencias sobre las causas del éxito en atletas veteranos españoles. *Rev Iberoam Psicol Ejercicio Deporte* 2015; 11(1): 37-46 [in Spanish]
- Batista M, Jiménez-Castuera R, Lobato S et al. Diferenças em função do género das formas de motivação autodeterminada de atletas veteranos. *Ágora Educ Fis Deporte* 2017; 19(1): 35-51 [in Portuguese]
- Diener E. The Remarkable Changes in the Science. *Perspect Psychol Sci* 2013; 8(6): 663-666
- Hagger MS, Chatzisarantis NLD. Transferring motivation from educational to extramural contexts: A review of the trans-contextual model. *Eur J Psychol Educ* 2012; 27(2): 195-212
- Hagger MS, Chatzisarantis NLD, Culverhouse T et al. The processes by which perceived autonomy support in physical education promotes leisure-time physical activity intentions and behavior: A trans-contextual model. *J Educ Psychol* 2003; 95(4): 784-795
- González-Cutre D, Sicilia À, Beas-Jiménez M et al. Broadening the trans-contextual model of motivation: A study with Spanish adolescents. *Scand J Med Sci Sports* 2014; 24(4): e306-319
- Hagger MS, Chatzisarantis NLD. The Trans-Contextual Model of Autonomous Motivation in Education: Conceptual and Empirical Issues and Meta-Analysis. *Rev Educ Res* 2016; 86(2): 360-407
- Orbell S, Hagger MS, Brown V et al. Comparing two theories of health behavior: A prospective study of non-completion of treatment following cervical cancer screening. *Health Psychol* 2006; 25(5): 604-615
- Hagger MS, Chatzisarantis NLD. Assumptions in research in sport and exercise psychology. *Psychol Sport Exerc* 2009; 10(5): 511-519
- Hagger MS, Anderson M, Kyriakaki M et al. Aspects of identity and their influence on intentional behaviour: comparing effects for three health behaviours. *Pers Individ Differ* 2007; 42(2): 355-367
- Hagger MS, Chatzisarantis NLD. Integrating the theory of planned behaviour and self-determination theory in health behaviour: A meta-analysis. *Br J Health Psychol* 2009; 14(Pt 2): 275-302
- Deci E, Ryan R. *The empirical exploration of intrinsic motivational processes*. *Adv Exp Soc Psychol* 1980; 13: 39-80
- Deci E, Ryan RM. *Intrinsic motivation and Self-determination in human behavior*. New York: Plenum Press; 1985
- Deci E, Ryan RM. A motivational approach to self: integration in personality. *Nebr Symp Motiv* 1990; 38: 237-288
- Deci EL, Ryan RM. The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychol Inq* 2000; 11(4): 227-268
- Vallerand RJ. A hierarchical model of intrinsic and extrinsic motivation for sport and physical activity. In: Hagger MS, Chatzissarantis N, editors. *Intrinsic motivation and self-determination in exercise and sport*. Champaign: Human Kinetics; 2007: 255-280
- Ajzen I. From intentions to actions: A theory of planned behavior. In: Kuhl J, Beckmann J, editors. *Action-control*. SSSP Springer Series in Social Psychology. Berlin, Heidelberg: Springer; 1985; 11-39
- Deci EL, Ryan RM. Self-determination theory. In: Van Lange PAM, Kruglanski AW, Higgins ET, editors. *Handbook of theories of social psychology*. London: Sage; 2012: 416-437
- Vallerand RJ. *The psychology of passion: A dualistic model*. New York: Oxford University Press; 2015
- Ryan RM. Psychological needs and the facilitation of integrative processes. *J Pers* 1995; 63(3): 397-427
- Moreno-Murcia J, Marzo J, Martínez-Galindo C et al. Validación de la Escala de "Satisfacción de las Necesidades Psicológicas Básicas" y del Cuestionario de la "Regulación Conductual en el Deporte" al contexto español al contexto español. *Rev Int Cienc Deporte* 2011; 7(26): 355-369 [in Spanish]
- Appel-Silva M, Wendt GW, Argimon II. A teoria da autodeterminação e as influências socio-culturais sobre a identidade. *Psicol Rev* 2010; 16(2): 351-369 [in Portuguese]
- Guimarães SÉ, Boruchovitch E. Estilo motivacional do Professor e a motivação intrínseca dos estudantes: uma perspectiva da teoria da autodeterminação. *Psicol-Reflex Crit* 2004; 17(2): 143-150 [in Portuguese]
- Simões F, Alarcão M. Satisfação de necessidades psicológicas básicas em crianças e adolescentes: adaptação e validação da ESNPBR. *Psicol-Reflex Crit* 2013; 26(2): 261-269 [in Portuguese]
- Ajzen I. The theory of planned behavior is alive and well, and not ready to retire. *Health Psychol Rev* 2015; 9(2): 131-137
- Gurtner JL, Gulfi A, Genoud PA et al. Learning in multiple contexts: are there intra-, cross- and transcontextual effects on the learner's motivation and help seeking? *Eur J Psychol Educ* 2012; 27(2): 213-225
- Mata J, Silva MN, Vieira PN et al. Motivational "spill-over" during weight control: increased self-determination and exercise intrinsic motivation predict eating self-regulation. *Health Psychol* 2009; 28(6): 709-716
- Pavey LJ, Sparks P. Autonomy and reactions to health-risk information. *Psychol Health* 2010; 25(7): 855-872
- Diener E, Emmons R, Larsen RJ et al. The satisfaction with life scale. *J Pers Assess* 1985; 49(1): 71-75
- Diener E. Assessing subjective well-being: progress and opportunities. *Soc Indic Res* 1994; 31(2): 103-157
- Lopes M. Hábitos de vida dos adolescentes: Género, ano de escolaridade e prática de atividade física. *Dissertação de Mestrado*. Universidade Técnica de Lisboa. Faculdade de Motricidade Humana. Lisboa: Universidade Técnica de Lisboa; 2012 [in Portuguese]
- Siqueira MMM, Padovam VAR. Bases teóricas de bem-estar subjetivo, bem-estar psicológico e bem-estar no trabalho. *Psicol Teoria Pesqui* 2008; 24(2): 201-209 [in Portuguese]
- Baker J, Fraser-Thomas J, Dionigi RA et al. Sport participation and positive development in older persons. *Eur Rev Aging Phys A* 2010; 7(1): 3-12
- Zarauz Sancho A, Ruiz-Juan F. Motivación, satisfacción, percepción y creencias sobre las causas del éxito en atletas veteranos españoles. *Rev Iberoam Psicol Ejercicio Deporte* 2016; 11(1): 37-46 [in Spanish]
- Da Silva ER. *Motivação de atletas idosos na associação de veteranos de atletismo do Estado do Rio de Janeiro*. PhD [dissertation]. Rio de Janeiro: Universidade de Niterói; 2009 [in Portuguese]

44. Hodge K, Allen JB, Smellie L. Motivation in masters sport: Achievement and social goals. *Psychol Sport Exerc* 2008; 9(2): 157-176
45. Ruiz-Juan F, Zarauz A. Predictor variables of motivation in Spanish master athletes. *J Hum Sport Exerc* 2012; 7(3): 617-628
46. Zarauz Sancho A, Ruiz-Juan F. Análisis de la motivación en el atletismo: un estudio con veteranos. *Univ Psychol* 2014; 13(2): 501-515 [in Spanish]
47. Batista M, Castuera RJ, Honório S et al. Self-determination and life satisfaction: An exploratory study with veteran judo athletes. *Rev Artes Marciales Asiáticas* 2016; 11(2s): 90-91
48. Iso-Ahola SE, St. Clair B. Toward a theory of exercise motivation. *Quest* 2000; 52(2): 131-147
49. Delgado SC, Marin BM, Ramos Sanchez JL. Métodos de Investigación y Análisis de Datos en Ciencias Sociales y de la Salud; Madrid: Piramide; 2011 [in Spanish]
50. Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct Equ Modeling* 1999; 6(1): 1-55
51. Schumacker R, Lomax RA. *Beginner's Guide to Structural Equation Modeling*. 3rd ed. London: Routledge; 2016
52. Vlachopoulos SP, Michailidou S. Development and initial validation of a measure of autonomy, competence, and relatedness in exercise: The basic psychological needs in exercise scale. *Meas Phys Educ Exerc Sci* 2006; 10(3): 179-201
53. Pires A, Cid L, Borrego C et al. Validação preliminar de um questionário para avaliar as necessidades psicológicas básicas em Educação Física. *Motricidade* 2010; 6(1): 33-51 [in Portuguese]
54. Moutão J, Cid L, Alves J et al. Validation of the Basic Psychological Needs in Exercise Scale in a Portuguese Sample. *Span J Psychol* 2012; 15(1): 399-409
55. Monteiro D, André E, Saraiva A et al. Tradução e validação do Behavioral Regulation Sport Questionnaire (BRSQ) numa amostra de atletas portugueses. XIV Jornadas da Sociedade Portuguesa de Psicologia do Desporto e III Congresso Galego-Português de Psicologia da Atividade Física e Desporto: Livro de resumos; 2013 Nov 22-23; Maia, Portugal. Maia: Instituto Superior da Maia; 2013: 86 [in Portuguese]
56. Lonsdale C, Hodge K, Rose EA. The Behavioral Regulation in Sport Questionnaire (BRSQ): Instrument Development and Initial Validity Evidence. *J Sport Exerc Psychol* 2008; 30(3): 323-355
57. Monteiro D, Moutão J, Baptista P et al. Clima motivacional, regulação da motivação e percepção de esforço dos atletas no futebol. *Motricidade* 2014; 10(4): 94-104 [in Portuguese]
58. Courneya KS, Bobick T. Integrating the Theory of Planned Behavior with the Processes and States of Change in the Exercise Domain. *Psychol Sport Exerc* 2000; 1(1): 41-56
59. Palmeira AL, Teixeira P. Validação Preliminar de um Instrumento de Avaliação da Teoria do Comportamento Planeado no Controlo de Peso. V Congresso de Psicologia da Saúde; 2004; Lisboa, Portugal; Lisboa: Ribeiro JLP; 2004 [in Portuguese]
60. Palmeira AL, Teixeira PJ, Branco TL et al. Predicting short-term weight loss using four leading health behavior change theories. *Int J Behav Nutr Phys Act* 2007; 4: 14
61. Ajzen I. The Theory of Planned Behavior. *Organ Behav Hum Process* 1991; 50(2): 179-211
62. Albuquerque FJ, Sousa FM, Martins CR. Validação das escalas de satisfação com a vida e afetos para idosos rurais. *Psico* 2010; 41(1): 85-92 [in Portuguese]
63. Neto F. The Satisfaction with Life Scale: Psychometric Properties in an Adolescent Sample. *J Youth Adolescence* 1993; 22(2): 125-134
64. Marsh HW, Richards GE, Johnson S et al. Physical Self-Description Questionnaire: Psychometric properties and a Multitrait-Multimethod analysis of relations to existing instruments. *J Sport Exercise Psy* 1994; 16(3): 270-305
65. Vallerand RJ. A hierarchical model of intrinsic and extrinsic motivation in sport and exercise. In: Roberts GC, editor. *Advances in motivation in sport and exercise*. Champaign, IL: Human Kinetics; 2001: 263-320
66. McDonald RP, Marsh HW. Choosing a multivariate model: Noncentrality and goodness of fit. *Psychol Bull* 1990; 107(2): 247-255
67. Bentler PM. Comparative fit indexes in structural models. *Psychol Bull* 1990; 107(2): 238-246
68. Bollen KA, Long JS. *Testing structural equation models*. Newbury Park, CA: Sage; 1993
69. Browne MW, Cudeck R. Alternative ways of assessing model fit. In: Bollen KA, Long JS, editors. *Testing structural equation models*. Newbury Park, CA: Sage; 1993: 136-162
70. Anderson JC, Gerbing DW. Structural equation modeling in practice: A review and recommended two-step approach. *Psychol Bull* 1988; 103(3): 411-423
71. Dodd J, Spinks W. Motivations to engage in masters sport. *ANZALS Leisure Research Series* 1995; 2: 61-75
72. Barkoukis V, Hagger MS, Labropoulos G et al. Extending the trans-contextual model in physical education and leisure-time contexts: examining the role of basic psychological need satisfaction. *Br J Educ Psychol* 2010; 80(Pt 4): 647-670
73. Moutão J, Alves S, Cid L. Contributo da teoria da autodeterminação na predição da vitalidade e adesão ao exercício físico. *Gymnasium Rev Educ Fis Desporto Saude* 2012; 3(1): 13-34 [in Portuguese]
74. Diener E, Suh EM, Lucas RE et al. Subjective well-being: Three decades of progress. *Psychol Bull* 1999; 125(2): 276-302
75. Hershberger SL. The problem of equivalent models. In: Hancock GR, Mueller RO, editors. *Structural equation modeling: a second course*. Greenwich, CT: Information Age Publishing; 2006
76. *Dictionary of Sport and Exercise Science*. Over 5,000 Terms Clearly Defined. London: A & B Black; 2006
77. Likert R. A technique for the measurement of attitudes. *Arch Psychol* 1932; 22(140): 1-55

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