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# **Predictive Model of Purpose of Life in Adolescents of Public Educational Institutions from Arequipa City**

**Modelo predictivo del sentido de vida en adolescentes de instituciones educativas públicas de la ciudad de Arequipa**

**Modelo preditor do sentido da vida em adolescentes de instituições educativas públicas da cidade de Arequipa**

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## **Abstract**

The objective of the study was to propose a predictive model about purpose of life in adolescents of public educational institutions from Arequipa City (Peru). We evaluated 872 students of the fourth and fifth of secondary education, of both sexes, from 14 to 18 years of age, of five public educational institutions according to the criteria of Westland (2010) for the structural equations. The instruments used were the Purpose of Life (PIL), Adolescent Coping Scale (ACS), the Beck Hopelessness Scale (BHS) and the Satisfaction with Life Scale (SWLS). The type of research is basic, non-experimental relational predictive explanatory level. To confirm the theoretical model was applied structural equation modeling (SEM) and to predict in probabilistic terms the meaning of life in adolescents according to the observed variables we used the multikappa perceptron (neural networks). In the results it was possible to predict the pattern of the purpose of life in adolescents, and provided the relative importance of the different predictors through the multikappa perceptron. The most important predictors are the satisfaction with life, the coping style led to the resolution of problems, the coping style directed to the relationship with others and lack of motivation.

Key words: purpose of life, coping, hopelessness, satisfaction with life.

## **Resumen**

El objetivo del estudio fue proponer un modelo predictivo del sentido de vida en adolescentes de instituciones educativas públicas de la ciudad de Arequipa (Perú). Se evaluó a 872 estudiantes del cuarto y quinto de secundaria, de ambos sexos, de 14 a 18 años de edad de cinco instituciones educativas públicas según los criterios de Westland (2010) para ecuaciones estructurales. Los instrumentos utilizados fueron el Test de Sentido de Vida (PIL), Escala de Afrontamiento para Adolescentes (ACS), Escala de Desesperanza de Beck (BHS) y la Escala de Satisfacción con la Vida (SWLS). El tipo de investigación es básica, no experimental relacional de nivel explicativo predictivo. Para confirmar el modelo teórico se aplicó el modelamiento de ecuaciones estructurales (SEM) y para predecir en

términos probabilísticos el sentido de vida en adolescentes en función a las variables observadas se utilizó el perceptrón multicapa (redes neuronales). En los resultados se logró predecir el modelo de sentido de vida de los adolescentes y se brindó la importancia relativa de los distintos factores predictores a través del perceptrón multicapa. Los factores predictores más importantes son la satisfacción por la vida, el estilo de afrontamiento dirigido a la resolución de problemas, el estilo de afrontamiento dirigido a la relación con los demás y falta de motivación.

Palabras clave: sentido de vida, afrontamiento, desesperanza, satisfacción con la vida.

## **Resumo**

O objetivo do estudo foi propor um modelo preditor do sentido da vida em adolescentes de instituições educativas públicas da cidade de Arequipa (Perú). Foram avaliados 872 estudantes do quarto e quinto ano do fundamental, de ambos os sexos, de 14 a 18 anos de idade de cinco instituições educativas públicas segundo os critérios de Westland (2010) para equações estruturais. Os instrumentos utilizados foram o Teste de Sentido de Vida (PIL), Escala de Enfrentamento para Adolescentes (ACS), Escala de Desesperança de Beck (BHS) e a Escala de Satisfação com a Vida (SWLS). O tipo de investigação é básica, não experimental relacional de nível explicativo preditor. Para confirmar o modelo teórico foi aplicado o modelamento de equações estruturais (SEM) e para prever em termos de probabilidade o sentido da vida em adolescentes em função das variáveis observadas se utilizou o perceptrón multicapa (redes neuronais). Nos resultados conseguiu-se prever o modelo de sentido de vida dos adolescentes e se brindou a importância relativa dos distintos fatores preditores através do perceptrón multicapa. Os fatores preditores mais importantes são a satisfação à vida, o estilo de enfrentamento dirigido à resolução de problemas, o estilo de enfrentamento dirigido à relação com os demais e falta de motivação.

Palavras-chave: sentido da vida, enfrentamento, desesperança, satisfação com a vida.

## Introduction

In Peru, there is not common empirical research from an existential or humanistic approach, however, the humanist trend has some important antecedents in the country, through the spiritualistic psychology that developed during the first half of the twentieth century (Alarcón, 1994, 2000; Arias, 2011, 2014, Salazar, 1954, 2013). This trend, however, had a phenomenological root common to humanistic psychology, but it would not be a psychological humanism itself, at least not as was raised by Maslow (1968), Allport (1973) or Rogers (1997), because humanism has been consolidated and diffused since the decade of the 1930's, and the spiritualist current in Peru was replaced by objective and experimental psychology in 1935. That is, spiritual psychology is related to humanistic psychology, in terms of its conception of man, but does not follow its foundational principles.

In that sense, humanistic psychology began to develop in the 1980s, when Víctor Amorós (1930-2005) assumed the management of the Psychological Clinic of the Universidad Nacional Mayor de San Marcos (Major National University of San Marcos) between 1980 and 1983, where he introduced the principles of the humanistic psychology in psychotherapeutic practice (Orellana, García, Soto, Herrera, Salazar, Orellana, Yanac, Malaver, & Chávez, 2007). In addition, he is the main diffuser of the humanist current through various articles (Amorós, 1990, 1991, 2003, 2004). Nowadays, we can also appreciate several review articles that talk about humanism, whether historical (Arias, 2015a) or related to logo therapy (Arbocco, 2015, Ramos, 2015; Solomon, 2013, 2014). Being the Universidad Femenina del Sagrado Corazón (Women's College of the Sacred Heart), the main house of studies that postulates and promotes the humanist trend in psychology in the country, although their approach and scope are essentially theoretical.

On the other side of the country, in Arequipa, second main city of Peru, there are two very important precedents. On ~~the~~ one hand, Guillermo Pareja (2007) who is a psychologist from Arequipa and lived in Mexico and shared several experiences with Viktor Frankl (1905-1997) in Vienna in the late 1970s, becoming one of the most important promoters of the logo therapy in Latin America, where the most relevant logo therapy centers are located in Mexico and Argentina. On the other hand, it is in Arequipa, that a major academic

research project has begun, which involves subjecting to empirical scrutiny various hypotheses based on humanistic psychology and, in particular, on Frankl's logotherapy. through the construct of purpose of life (Huamani, & Ccori, 2016). In this way, it is in this city, where the empirical investigations on logotherapy begin, and as part of this project, the present study aims to analyze the predictive power of various variables on the purpose of life in adolescents in the city.

### **Purpose of life in adolescents, coping, hopelessness and satisfaction with life**

Adolescence constitutes a moment of vulnerability, where ~~the~~ person has to prepare for adulthood. It takes on a special significance when it occurs in situations of risk, fragility and precariousness in relational, familiar and social ties (Arias, 2013). However, regardless of any factor, every teenager is in ~~the~~ search and definition of an identity (Erikson, 2000), and in this complex process they often incurred in risk behaviors which, through empirical research, have shown to be related to the so-called existential vacuum (Frankl, 1980, Gallego, & García, 2004). In this regard, then, arises a need to explore the meaning of life in the population of adolescents and specifically the predictive variables of the same, because "Who has a reason to live, can bear almost any how" (Nietzsche, quoted by Frankl, 1983, p. 113).

The study of the purpose of life is based on Viktor Frankl (1983), who defines it as "the desire to find a concrete sense of personal existence" (p. 143). In this regard, human capacity to respond freely and voluntarily to each situation of life (Adams, 2014), understanding what a particular situation represents (Santis, & Juárez, 2011), so that a person is happy when he finds a sense in which to base his life (Domínguez, 2007, Frankl, 1980).

Although the search for purpose and meaning is present in all stages of development, during adolescence it intensifies (Moreno, & Rodríguez, 2010). In this regard, several studies report that there are no differences in the meaning of life according to age and sex (García, Gallego, & Pérez, 2009; Gallego, & García, 2004; Noblejas, 1994; Viñas et al.

2004). However, some studies have pointed out that between the ages of 16 and 20 years old, there is a greater sense of life (Martínez, & Castellanos, 2013).

On the other hand, the purpose of life has been related to various psychological variables. Thus, it has been evidenced that the purpose of life is an important factor life and for coping with stressful situations (Barboza, & Pérez, 2013). Coping is understood as the set of cognitive and affective actions that arise in response to a particular concern and attempt to restore balance (Frydenberg, & Lewis, 1997). Therefore, studies in Peru have linked it with health, in various contexts such as clinical, labor and educational (Arias, 2015b). Other studies have also found that women tend to employ more coping strategies in reference to others (Cassaretto, Chau, Oblitas, & Valdez, 2003, Mikkelsen, 2009, Canessa, 2000), as well as to deal with the problem (Montenegro, 2001), but their coping strategies are sometimes unproductive (Canessa, 2000; Mikkelsen, 2009). In contrast, males use more frequent physical distraction and prefer to ignore the problem (Canessa, 2000; Mikkelsen, 2009), It is also evidence the use of a style directed to the problem (Cassaretto, Chau, Oblitas, & Valdez, 2003).

On the other hand, coping strategies vary according to the phases of adolescence (Gaeta, & Martín, 2009), younger adolescents rely more on social support (Govaert, & Grégoire, 2004), and as they grow up, they have greater options for a given circumstance (Massone, & González, 2007). However, other studies indicate that their repertoire of incongruity is also expanded (González, Montoya, Martina, & Bernabéu, 2002), because there is evidence that 16-year-old adolescents are more likely to resort to unproductive strategies (Guadalupe, & Moysén, 2015).

Now, as it has been said, problems are present throughout life, but particularly in adolescence, they are often perceived more seriously by the difficulty of managing them; even going so far as to believe that they have no solution, and then there is the idea that there is no hope of relief. In this case, reference is made to hopelessness (Beck, Kovacs, & Weissman, 1979), conceived as a mood of attitude and negative perception that the person has about the future events (Quintanilla, Haro, Flowers, Celis de la Rosa, & Valencia, 2003), whether immediate or remote (Stotland, 1969). Both men and women experience



hopelessness, but according to some studies in Latin America, women experience it more frequently (Valdez et al., 2014).

On the other hand, there is evidence that high levels of hopelessness are related to the presence of existential emptiness, which is understood as the inability to discover meaning in life, and this incapacitation prevents knowing what to do or how to guide oneself, as well as not knowing what is really wanted (Lukas, 2001; Gallego, & García, 2004; Edwards, & Holden, 2003; Hunter, & O'Connor, 2003). In turn, this disability is directly related to suicide (Ceballos, & Chávez, 2016, García, Gallego, & Pérez, 2009). In studies done in Arequipa, it has been found that while suicide is mediated by cognitive factors (Galagarza, 2006), a predominant risk factor is family problems, and the age at greatest risk is between 18 and 25 years of age (Hanco, & Pérez, 2006). That is, when the identity of the adolescent is beginning to consolidate and when it begins to develop the project of life that will give meaning to his or hers existence.

In this sense, the proper management of a stressful event could reduce negative emotions and, rather, maintain or generate greater psychological well-being (Figuerola, Contini, Lacunza, Levin, & Estévez, 2005). Psychological well-being consists of three interrelated components: positive affect, absence of negative affect, and satisfaction with life as a whole (Diener, Emmons, Larsen, & Griffin, 1985). Thus, satisfaction with life is the evaluation of subjective judgments of life circumstances (Atienza, Pons, Balaguer, & García-Merita, 2000), that is, an appreciation value of something, covering cognitive assessments and at the same time affective disorders (Veenhoven, 1994). In other words, it's the degree to which a person likes the life they lead. In terms of age, satisfaction with life seems to decrease with time (UNICEF, 2007) and this trend is slightly higher in women (WHO, 2008). However, there is evidence that women show more favorable behaviors in relation to optimism, satisfaction with themselves and with life (Salgado, 2009), while being more likely to experience some degree of happiness, linking it to health and well-being (Castilla, Caycho, & Ventura, 2016).

Considering that the way in which the adolescent evaluates his / her vital situation in terms of subjective well-being influences the goals that he / she poses or constructs (Salmela-Aro, & Nurmi, 1997), it is important to take into account that goal, the same as the desire to

achieve something in life, and that is how making or producing something is one of the ways in which the human being finds meaning (Frankl, 2002). In this regard, young people with a high degree of satisfaction with life tend to directly confront the problems from various approaches, be highly motivated and highlighting the positive aspect of the situation that generates stress (Mikkelsen, 2009). There are in addition, studies in Peru, which has reported relations between the satisfaction with life and the way to deal with stressful situations, so that coping styles focused on the problem are positively correlated with the satisfaction with life, and avoidant coping styles, are correlated negatively with the construct of life satisfaction (Green, 2016).

In view of all the foregoing considerations here raised, the theoretical model that aims to demonstrate, in coherence with the studies reviewed in Arequipa, Peru, Latin America and the world; focuses on the relationship between the latent exogenous variables: coping styles (Barboza, & Perez, 2013), hopelessness (Garcia et al., 2008) and satisfaction with life (Salmela-Aro, & Nurmi, 1997), with the endogenous variable sense of life. In addition, there is a correlation between two of the exogenous variables (Mikkelsen, 2009) and since these are individually influential on the variable life meaning, it would be correct to state that the correlation between both influences the endogenous variable.

Philosophically, our theoretical model responds to the complexity paradigm (Morin, 2007), and theoretically, it is based on the logo therapy of Frankl (1994), for whom man achieves happiness when he finds meaning in his life (Frankl, 2002). This search for meaning is endowed with multiple experiences that become a transcendent state (Frankl, 2006), in which the person finds the meaning of their existence, through various motives that have a vital and distinctive relevance for each human being. These reasons may relate to a wide range of issues such as religion, work, family, love, the academic production or several of them (Frankl, 1980). When the person finds meaning in his life, he experiences states of satisfaction that allow him to face the most difficult situations, but when there is no sense in which to anchor one's life, feelings of anguish, hopelessness, and consequently, there could be no adequate coping with daily and vital stressors (Frankl, 1987).

In this sense, the research tries to test an explanatory model of the purpose of life in adolescents and to propose a predictive model for the meaning of life based on the values of

the predictor variables: coping styles, satisfaction with life and hopelessness; through the application of neuronal networks of multikappa perceptron.

## **Method**

### ***Participants***

The sample consisted of 872 students from five educational institutions (2 males, 2 females and 1 mixed), both sexes from 14 to 18 years old ( $M = 15.47$ ,  $SD = 0.80$ ). 46.9% are men and 53.1% are women. 50% of students are 15 to 16 years old. 51.8% were from 4th grade and 48.2% from 5th grade. The sample was selected non-probabilistically for convenience and participants were informed of the study objective. The criterion for selecting this amount of sample is justified because in the field of structural equations as a general rule, it is usually said that the minimum size should be  $N = 200$ , or  $N = 20$ , where  $N$  is the number of indicators (Westland, 2010), that is, for each study indicator, 20 subjects should be considered. In the study we have 18 coping strategies, 4 factors of the purpose of life, 3 factors of hopelessness and 1 variable called satisfaction with life, that is, 26 indicators to study by the proposed condition of 20 subjects of analysis, we need at least to 520 students. For its part, Jackson (2003) indicates that the minimum recommended sample size is 200 subjects for any SEM.

### ***Instruments***

Purpose in Life Test (Crumbaugh, & Maholick, 1969), adapted for Argentine population by Noblejas (2000) and for Spanish population by García-Alandete, Martínez and Sellés, (2013). It consists of 20 items with seven response alternatives on a Liker scale. The areas measured by the Test are: Perception of meaning, capture of motives and reasons to live life and the valuation that is generally deserved; Experience of sense, perception of one's life and daily life as full of good things; Goals and tasks, objectives linked to concrete actions of life and the personal responsibility perceived towards them; Dialectic destiny / freedom, voltage vs. destination freedom and coping with death as an uncontrollable, unpredictable and inevitable event. For the case of this study, four factors were obtained after performing a confirmatory factor analysis, which had adequate indices of goodness of fit. Reliability

was obtained using the internal consistency method with the Cronbach Alpha test, with an index of .91 (Huamani, & Arias, 2017a).

The Adolescent Coping Scale (Frydenberg, & Lewis, 1997) adapted by Pereña and Seisdedos (1997) for Spanish-speaking samples and subjected to a psychometric analysis by Caycho, Castillo and Shimabukuro (2014) for Peruvian samples, which assesses 3 styles of coping and 18 coping strategies coping. The styles are: Style aimed at problem solving, which refers to efforts to solve the problem by maintaining an optimistic and socially connected attitude; Relationship-oriented style, which refers to efforts to solve the problem through the support of others; Unproductive style, which refers to the use of avoidant strategies. The test has been analyzed psychometrically for the present study, with adequate indexes of goodness of fit being reported using confirmatory factor analysis and reliability indexes above  $\alpha = .70$  (Arias, & Huamani, 2017a).

Beck Hopelessness Scale (Beck, Weissman, Lester, & Trexle, 1974), adapted for the Peruvian population by Aliaga, Rodríguez, Ponce, Frisancho and Enríquez (2006). The instrument consists of 20 items distributed in three factors: Lack of motivation (FM), refers to the motivational aspect; Future Expectations (EF), which assesses the cognitive aspect; Feelings about the future (SF), or affective factor, that identify a positive affective tone like enthusiasm, hope, happiness, faith and good times. The test was validated for the study sample using confirmatory factor analysis, which provided adequate measures of goodness of fit, although reliability indexes were low but acceptable (Huamani, & Arias, 2017b).

Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), adapted for Spanish-speaking sample by Atienza, Pons, Balaguer and García-Merita (2000). The instrument measures life satisfaction through five items, of which two are inversed, and are arranged on a Likert-type response scale with five response alternatives, from "Totally Disagree" to "Totally Agree". For the present study, a psychometric analysis was performed through confirmatory factorial analysis that provided adequate measures of goodness of fit, and reliability was obtained using the Cronbach's Alpha test, with an index of .788 (Arias, & Huamani, 2017b).

### ***Procedure***

The instruments were applied considering the instructions of the same test, with prior informed consent. Once each instrument was applied, it was subjected to the exploratory factor analysis (SPSS v.22) and later the confirmatory factor analysis (Amos v.22) was applied, to give validity and reliability to each of the instruments. Reports of psychometric results have been submitted to Latin American journals of psychological and medical research.

To explore the data, descriptive statistics were used through measures of central tendency, measures of variability, shape and position. To perform the comparisons and differences according to age and sex, parametric data analysis was used for independent samples, that is, the tests of Student t and One way Anova.

In order to confirm the theoretical model, the modeling of structural equations was applied (Ruíz, 2000) and to predict in probabilistic terms the meaning of life in adolescents as a function of the observed variables the multilayer perceptron (neural networks) was used.

The measurement model for the latent variable exogenous sense of life, coping styles, hopelessness and satisfaction with life, was as follows:

$$y = \Lambda_y \eta + \varepsilon$$

*Being*

$\eta$ : the endogenous latent variables

$\Lambda_y$ : matrices of coefficients of indicators of endogenous variables

$\varepsilon$ : are the measurement errors

The structural model that specifies the linear causal equations among the latent variables of the model was:

$$\eta = \beta \eta + \tau \xi + v$$

Being:

$\eta$ : endogenous variable

$\beta$ : matrix of coefficients of endogenous variables

$\tau$ : coefficient matrix of the exogenous variable

$\xi$ : exogenous variable

$v$ : term random perturbation

Therefore, the structural equation proposed for the model would be the following:

$$\text{Purpose of life} = \text{ERP} + \text{ERD} + \text{EI-FM} + \text{EF} + \text{SF} + \text{SWLS} + \xi$$

## Results

### *Descriptive results*

The comparative descriptive analysis of the meaning of life in adolescents indicates an inner sense of accomplishment with a tendency towards a high sense of inner achievement in all factors (F1:  $M = 34.61$ ,  $SD = 7.61$ , F2:  $M = 20.25$ ,  $\pm SD = 4.45$ , F3:  $M = 210.79$ ,  $SD = 3.66$  and F4:  $M = 10.74$ ,  $SD = 2.35$ ). The inner achievement of meaning in general is in the middle level ( $M = 99.47$ ,  $\pm SD = 17.03$ ), likewise, there are no differences in the meaning of life according to age and sex.

With regard to problem-solving coping styles, the adolescents investigated presented medium scores with a tendency towards low scores ( $M = 62.66$ ;  $\pm SD = 12.24$ ). In analyzing the coping strategies of this style, it was found that in the Physical Distraction strategy there are differences by age, where students of 14, 15, 16 and 17 years present higher scores than students of 18 years ( $F_{(4)} = 2825$ ,  $p = .024$ ). Likewise, there are differences respect to sex, where male students present higher scores than women ( $t_{(870)} = 5.713$ ,  $p = .000$ ). Likewise, in the coping strategy Positive, there are differences between males and females, with female students using this strategy, to a greater extent than males ( $t_{(870)} = -5.368$ ;  $p = .000$ ).

In the style of coping directed to Relationship with others, most adolescents present a medium score with a tendency towards high scores ( $M = 46.74$ ;  $\pm SD = 8.82$ ). In this style of coping, the coping strategy seeks social support male students use this strategy, to a greater extent than women ( $t_{(870)} = 5.614$ ;  $p = .000$ ).

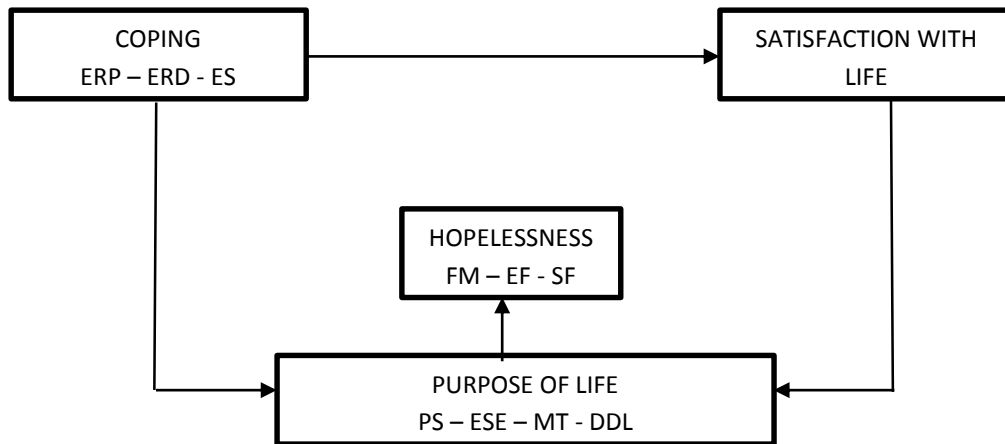
Regarding the unproductive style, adolescents present medium scores with tendency towards high scores ( $M = 55.06$ ;  $\pm SD = 8.37$ ). And with respect to the strategies used by adolescents in this style, in the strategy Making illusions students who are 18 years old use this coping strategy to a lesser extent than students of other ages ( $F_{(4)} = 3,880$ ;  $p = .004$ ). Likewise, in the Ignorance problem coping strategy, male students use this strategy to a greater extent than women ( $t_{(870)} = 4.099$ ;  $p = .000$ ). However, in the Coping Strategy, female students use it to a greater extent than males ( $t_{(870)} = -2.254$ ;  $p = .000$ ).

In the factors of hopelessness, the adolescents present low scores in the Factor Lack of Motivation, high scores on the Future Expectations and Feelings for the Future factors. Adolescents presented high scores (F1:  $M = 1.96$ ,  $SD = 1.09$ , F2:  $M = 3.10$ ,  $SD = 1.03$ , F3:  $M = 3.42$ ,  $SD = 0.08$ ). Regarding the variable hopelessness, in general, adolescents present low scores, that is, presenting low scores indicates that there is mild hopelessness and in which higher scores would indicate moderate or severe hopelessness ( $M = 8.44$ ;  $\pm SD = 1.92$ ). Likewise, no differences were found regarding age and sex in this variable.

Concerning the variable satisfaction with life, adolescents present high scores on the life satisfaction variable ( $M = 18.66$ ;  $\pm SD = 4.52$ ). Likewise, students who are 18 have high life satisfaction scores as opposed to 14, 15, 16 and 17 year olds ( $F_{(4)} = 2,922$ ;  $p = .021$ ).

### ***Theoretical model of the meaning of life in adolescents***

The theoretical model constructed, indicates that the variable life meaning is positively related to the confrontation (Barboza, & Pérez, 2013). At respect to the hopelessness variable, García et al. (2009) would indicate an inverse relationship between sense of life (inner achievement of good sense) and hopelessness. Regarding satisfaction with life, it would influence the goals that the adolescent poses or constructs (Salmela-Aro, & Nurmi, 1997), and the dimension of goals and tasks constitutes a relevant factor for the analysis of the variable sense of life. It has also been found that young people with a high degree of satisfaction with life tend to face problems directly from various approaches, being highly motivated and highlighting the positive aspect of the stress situation (Mikkelsen, 2009). The theoretical model of the purpose of life is shown in Figure 1.



*Figure 1. Theoretical model of the Sense of life*

In confirming the theoretical model through the modeling of structural equations (SEM), it is observed in the final model estimated that coping styles, the factors of hopelessness and satisfaction with life have a direct effect on the meaning of life, except some styles and factors that have negative effects.

In the estimated final model, the goodness of fit indicators meet the criteria to confirm the model, finding that  $X^2$  is not significant for a level  $\alpha = .05$ , and that the indexes CFI (Bentler, 1988), NFI (Bentler, 1992), GFI (Ullman, 2006), exceed the value of .90, as well as the root mean square approximation residue (RMSEA) is less than .08 (Ullman, 2006). The estimated parameters of the explanatory model of the meaning of life are shown in Table 1.

*Table 1.*

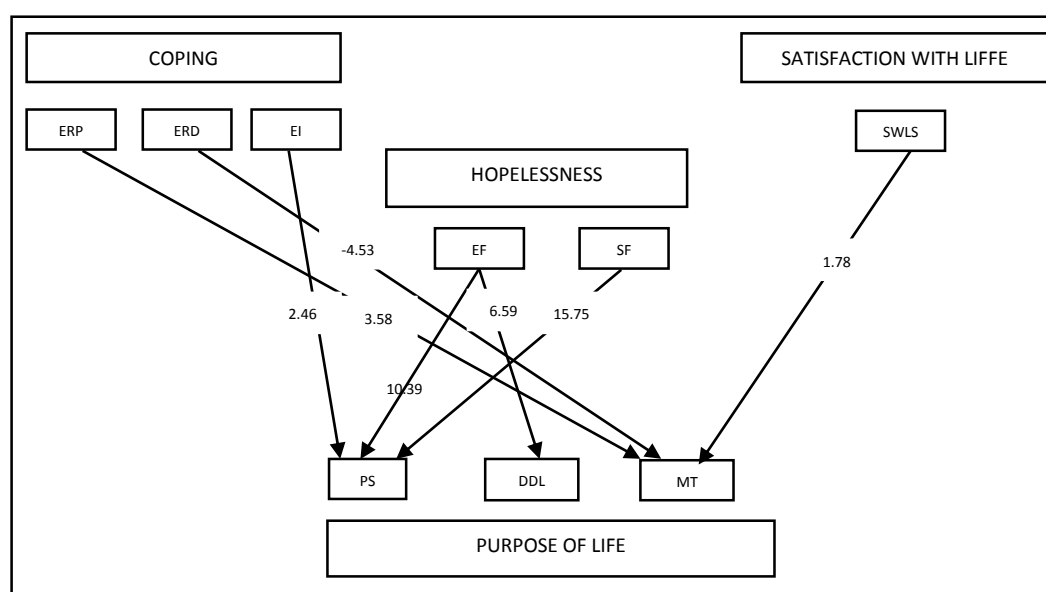
*Estimated parameters of the explanatory model of the meaning of life in adolescents*

			Estimate	S.E.	C.R.	p
PS	<---	ERP	-0.973	1.086	-0.896	0.37
PS	<---	EI	2.461	1.148	2.144	0.032
PS	<---	ERD	-0.454	1.096	-0.414	0.679
PS	<---	SF	-15.75	5.75	-2.739	0.006
PS	<---	EF	10.394	3.38	3.075	0.002
DDL	<---	SWLS	0.971	0.894	1.086	0.278
DDL	<---	ERP	1.899	1.843	1.03	0.303
DDL	<---	EI	1.163	0.783	1.486	0.137
DDL	<---	ERD	-3.271	2.152	-1.52	0.129
DDL	<---	SF	-5.902	6.985	-0.845	0.398



DDL	<---	EF	6.592	3.601	1.831	0.067
ESE	<---	SWLS	1.336	0.922	1.45	0.147
ESE	<---	ERP	2.485	1.934	1.285	0.199
ESE	<---	EI	0.859	0.716	1.199	0.23
ESE	<---	ERD	-3.724	2.325	-1.602	0.109
ESE	<---	SF	-3.491	6.518	-0.536	0.592
ESE	<---	EF	5.122	3.161	1.62	0.105
MT	<---	SWLS	1.786	0.969	1.844	0.065
MT	<---	ERP	3.583	2.097	1.709	0.088
MT	<---	ERD	-4.526	2.735	-1.655	0.098
MT	<---	SF	5.39	4.033	1.337	0.181

With the obtained factors (latent variables) and based on the estimated parameters, the relationships were interpreted, taking into account the levels of significance, and it should be clarified that obtaining a standardized coefficient higher than unity does not indicate an error in the confirming or estimation factorial model. The estimated model with the significant variables is shown in Figure 2.



*Figure 2. Summary of the estimated final model of the Sense of life in adolescents*

In this sense, it is confirmed that the Unproductive style (EI) and the Future Expectations (EF), have a direct impact on the perception of meaning of life (PS), while Feelings about the future (SF), style (ERD) and the style of coping addressed to Problem Solving (ERP), have a negative effect on the perception of sense (PS) of adolescents.

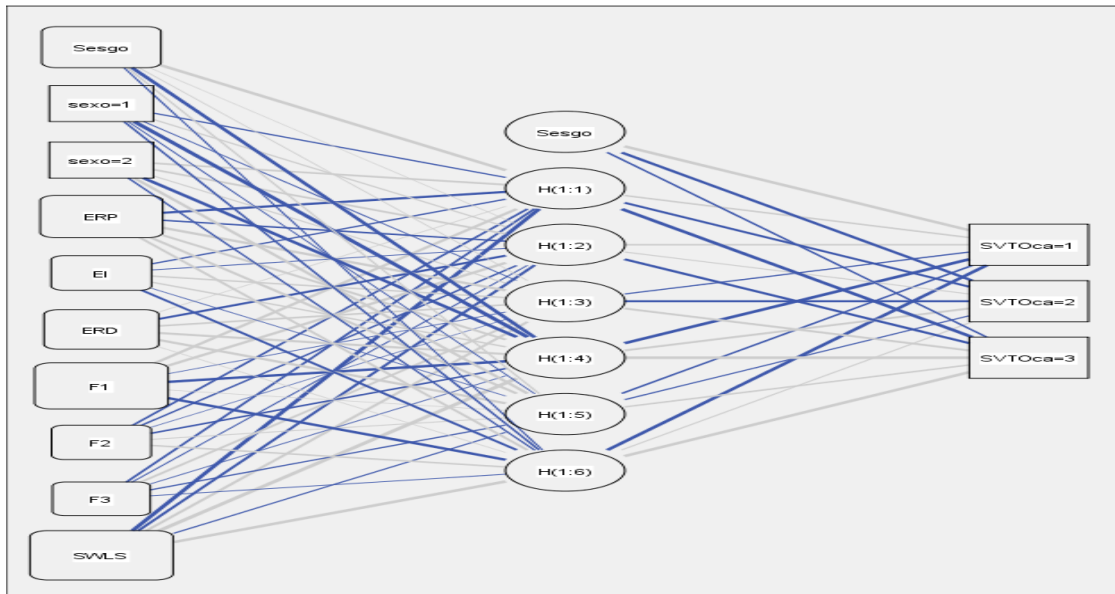
Likewise, Future Expectations (EF), Life Satisfaction (SWLS), Problem-Solving (ERP) - based coping style, and Unproductive Coping Style (EI) have positive effects on Sense Experiences (ESE) of the adolescents' sense of life, however, the style of coping directed at the Relationship with Others (ERD) and Feelings with respect to the future (SF), have negative effects on the Experiences of Sense (ESE) of adolescents.

With respect to the Dialectic factor destination / freedom (DDL), the latent variables that have positive effects are Future Expectations (EF), Unproductive Coping Style (EI), Life Satisfaction (SWLS) and Directed Coping Style to Problem Solving (ERP); while the style of coping aimed at the Relationship with Others (ERD) and Feelings with respect to the future (SF) has negative effects on the endogenous dialectic destination / freedom (DDL) variable of adolescents' life meaning.

Finally, the style of coping addressed to Problem Solving (ERP), Satisfaction with Life and Feelings about the Future (SF) have positive effects on the endogenous variable Goals and Tasks (MT) of the meaning of life in adolescents. However, the style of coping aimed at the Relationship with Others (ERD), has negative effects on endogenous goals and tasks (MT) of the meaning of life in adolescents.

### ***Multikappa Perceptron***

The probabilistic prediction of the meaning of life in adolescents according to the observed variables was based on the multikappa perceptron (neural networks).



*Figure 3. Feedforward architecture with a hidden layer of the predictive model of the sense of life in adolescents.*

The neural network has identified the factors that explain the meaning of life in adolescents, within which it considers as the most important Satisfaction with life, Lack of motivation, style of coping aimed at problem solving and the style of coping directed to the relation with the others, as the variables that influence in high percentages in the sense of life of the adolescents.

*Table 2.*

*Importance of independent variables in the meaning of life in adolescents*

	Importance	Standardized Importance
Satisfaction with life	0.314	100.00%
Lack of motivation	0.250	79.70%
Style of problem solving	0.179	57.00%
Style Driven to Relations with Others	0.127	40.70%
Sex	0.057	18.10%
Unproductive style	0.032	10.30%
Future Expectations	0.027	8.50%
Feeling about the future	0.015	4.70%

Likewise, the neural network has identified the coping styles, the factors of hopelessness and satisfaction with life that explain and predict the meaning of life in adolescents, within which it considers as the most important Future Expectations, followed by Search Professional help, Search Social help, Feelings about the future, concentrate on Solving problems, Relaxing or fun; and as those factors that influence but not with high percentages, one has the strategy to focus on the Positive, Endeavor and succeed, Physical Distraction, Invest in Intimate Friends, Satisfaction with life and sex. The factors that do not predict in the student the inner attainment of bad sense or the inner attainment of good sense are all strategies of the Unproductive coping style and the lack of motivation factor of hopelessness (Table 3).

Table 3.

*Importance of coping strategies, factors of despair and satisfaction with life in the purpose of life in adolescents*

	Importance	Standardized Importance
Future Expectations	0.200	100.00%
Seek professional help	0.104	52.00%
Search social support	0.090	44.90%
Feelings about the future	0.089	44.30%
Concentrate on problem solving	0.084	42.00%
Search relaxing amusements	0.083	41.60%
Look at the positive	0.071	35.30%
Strive and succeed	0.068	34.10%
Physical distraction	0.060	29.90%
Invest in close friends	0.059	29.60%
Satisfaction with Life	0.049	24.60%
Sex	0.044	22.00%

Based on the factors of standardized importance identified in the neuronal network, in probabilistic terms, it was found that in adolescents with bad inner sense it is predicted that 65% of them (255 adolescents) will continue to maintain a bad sense of life and 34.9% will improve to an inner achievement of good sense.

Table 4.

*Predicted value for total categorized life expectancy (SVTOca) in adolescents*

Real data			Predicted value for SVTOBI		Total
			Bad sense of life	Bad sense of life	
Binary total sense of life	Bad sense of life	Count	255	137	392
		% within Sense of life	65.1%	34.9%	100.0%
	Good sense of life	Count	93	387	480
		% within Sense of life	19.4%	80.6%	100.0%
Total		Count	348	524	872
		% within Sense of life	39.9%	60.1%	100.0%

Likewise, in students who have good inner sense achievement, 19.4% are predicted to have bad inner sense achievement (93 students) and 80.6% are predicted to maintain their inner good sense achievement (387 students). These data indicate that the increase or improvement of the factors analyzed will improve the sense of life in adolescents (Table 4).

## **Discussion**

There are few empirical studies on the meaning of life in Latin America (Martínez et al., 2012; García-Alandete et al., 2013, Noblejas, 1994, 2000; García, Gallego, Pérez, & 2009, Gallego, & García, 2004). Therefore, the results obtained in this work are relevant for future Spanish studies that suggest the use of PIL, and the integration and testing of the models can generate new studies and theoretical and empirical reflections on the measurement of the purpose of life.

In this sense, in explaining the model of the meaning of life, the unproductive coping style is the one that has the greatest influence with respect to the variable purpose of life, unlike styles directed towards the relationship with others and the style of solving the problem. It could be argued that in adolescents, using strategies that provide relief (Mikkelsen, 2009) would allow them to experience a greater sense of life. This may be due to the fact that they accept the adverse content of the reality they have to live in, because they know how to suffer it and through that suffering lead to some achievement (Frankl, 1987, 2002). Consequently, for adolescents, the friendship links have a vital importance, so it is probable that although they do not deal with solving their problems directly, if they are attentive to the problems of their group of friends and when one of them experiences an adverse situation similar to the one they experienced, then an accompaniment occurs. Barboza and Pérez (2013) found that the meaning of life is an important factor for coping with stressful situations, thus establishing a correlation or covariance between the exogenous latent variable (coping) and the endogenous latent variable (purpose of life).

When analyzing the relationship between hopelessness and meaning of life, it was found that lack of motivation is not related to any of the factors of the meaning of life. However,

future expectations, which evaluate the cognitive aspect of hopelessness, are related to the perception of meaning, experience of meaning and dialectic destiny / freedom. Future expectations are linked to the construction of the vital project of each person, so the results are congruent, since the vital project expresses the fundamental choices of the person, which means assuming, in their social praxis, the directions of their life towards important ends that must be realized. Therefore, project and vital meaning constitute a dialectical unit of the person's life options (D'Angelo, 2002). Likewise, the variable feelings about the future are inversely related to the factors perception of meaning, experience of meaning and dialectic destiny / freedom of the purpose of life. Data indicate that the adolescents express enthusiasm and hope for their future, however, would find it difficult to find reasons for living in the present. In this way, they would not perceive their daily life in terms of good things and would not exercise their freedom to confront unpredictable situations. On the other hand, feelings towards the future are directly related to goals and tasks, which means that when they feel enthusiasm for their future, they will set goals and assume responsibility for them. In this sense, Yalom (1980) indicates that personal dedication to clear and defined personal vital goals is associated with the achievement of a sense of life. Also, García et al. (2009), Gallego and García (2004) and (Lukas, 2001) have pointed out that the existential vacuum is significantly associated with higher levels of hopelessness and that the presence of the meaning of life requires little or no hopelessness.

The relationship between the variable satisfaction with life and the factors goals and tasks, experience of meaning and dialectic destiny / freedom of the purpose of life, would indicate that if adolescents evaluate the overall quality of their life together positively then they would find motives and reasons to live. In turn they would perceive their daily life in fullness of good things, being able also to exercise their freedom for the confrontation of unpredictable circumstances. Therefore, if a teenager considers his life as favorable, he experiences positive emotional experiences, then he favors the achievement of a sense of life through experiential values (Frankl, 1983, 2002). These emotional experiences are also important for mental health, for which the conviction and the personal sense that life makes sense (in turn, and in a critical way) influence (Ryff, & Keyes, 1995). In this sense, adolescents who evaluate their vital situation in terms of subjective well-being, influence

the goals that are posed, since the satisfaction factor is related to the goals and tasks factor (Salmela-Aro, & Nurmi, 1997).

Finally, when predicting the meaning of life of adolescents, the most important predictors are satisfaction for life, style of coping aimed at problem solving, style of coping directed at relationship with others, which as pointed out, are adequate coping styles (Richaud, 2006). Therefore, if we want students to present an inner achievement of good sense, it is necessary to strengthen, orient, provide coping strategies, motivate them permanently and allow adolescents to present a positive attitude towards life (Montenegro, 2001).

In the research carried out, a predictive model of the adolescents' sense of life, a methodological model is presented to confirm a theoretical model and to predict it, however, the work escapes an algorithmic and statistical explanation, and points rather to a psychological explanation and social relation of the variables predicting the meaning of life of adolescents in Arequipa.

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