

## Proposal of an instrument to evaluate happiness: The Sophie Model

Propuesta de un instrumento para evaluar la felicidad: el Modelo Sophie

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### Abstract

Given the importance of happiness for human beings, in this work an instrument was developed and evaluated to determine the level of happiness: the Sophie Model. For the evaluation, a factor analysis of the items was carried out; for the extraction of the factors, diagonally weighted least squares and a robust prominent rotation algorithm were used. The instrument was constructed from 78 items, which describe five dimensions of happiness: social relationships, life goals, inner balance, external vision and physical health. The instrument was applied to two samples of participants, together with the Subjective Happiness Scale: 417 people from Nicaragua (age 24.3 years  $\pm$  9.5 years, 60% women) and 71 people from Colombia (age 29.2 years  $\pm$  13.4 years, 51% women). According to the results obtained, unlike the initial model of the five dimensions proposed, the following were found: family, friends, physical health, external vision, purpose in life and internal balance, which has the appropriate adjustment indexes (RMSR, RMSEA, CFI, NNFI), as well as an adequate reliability estimated from Cronbach's alpha ( $\alpha > 0.7$ ). The Sophie Model and its subscales correlated positively and significantly ( $p < 0.05$ ) with the Subjective Happiness Scale. For the Nicaraguan sample, it was found that professionals are happier than students ( $p < 0.05$ ), but this result was not replicated in the Colombian sample. It was also found that the Colombian sample is happier than the Nicaraguan sample ( $p < 0.05$ ). It is concluded that the Sophie Model and its five dimensions can explain happiness. Additionally, the instrument designed has adequate psychometric

properties to estimate happiness and could be used in evaluation studies of public and organizational policies and their impact on people's well-being. In subsequent studies, with a larger and more diverse sample, it will be possible to refine the instrument.

**Key words:** well-being, test, factors, reliability, validation

### Resumen

Dada la importancia que tiene la felicidad para el ser humano, en este trabajo se desarrolló y evaluó un instrumento para conocer el nivel de felicidad: el Modelo Sophie. Para la evaluación, se realizó un análisis factorial de los ítems; para la extracción de los factores se empleó los mínimos cuadrados ponderados diagonalmente y como algoritmo de rotación promin robusto. El instrumento se construyó a partir de 78 ítems, que describen cinco dimensiones de la felicidad: relaciones sociales, objetivos en la vida, equilibrio interior, visión externa y salud física. Fue aplicado a dos muestras de participantes, junto con la Escala de Felicidad Subjetiva: 417 personas de Nicaragua (edad 24.3 años  $\pm$  9.5 años, 60% mujeres) y a 71 personas de Colombia (edad 29.2 años  $\pm$  13.4 años, 51% mujeres). De acuerdo a los resultados obtenidos, a diferencia del modelo inicial de las cinco dimensiones planteado, se encontraron los siguientes: familia, amigos, salud física, visión externa, propósito en la vida y equilibrio interno, que tiene los índices de ajuste apropiados (RMSR, RMSEA, CFI, NNFI), así como una confiabilidad adecuada estimada a partir del alfa de Cronbach ( $\alpha > 0.7$ ). El Modelo Sophie y sus subescalas, se correlacionaron en forma positiva y significativa ( $p < 0.05$ ) con la Escala de Felicidad Subjetiva. Para la muestra de Nicaragua, se encontró que los profesionales son más felices que los estudiantes ( $p < 0.05$ ), pero este resultado no se replicó en la muestra Colombia. También se encontró que la muestra de Colombia es más feliz que la de Nicaragua ( $p < 0.05$ ). Se concluye que el Modelo Sophie y sus cinco dimensiones, permiten explicar la felicidad. Adicionalmente, el instrumento diseñado tiene las propiedades psicométricas adecuadas para realizar la estimación de la felicidad, y puede ser empleado en estudios de evaluación de políticas públicas y organizacionales y su impacto sobre el bienestar de las personas. En estudios posteriores, con una muestra más amplia y diversa, se podrá afinar el instrumento.

**Palabras claves:** bienestar, test, factores, confiabilidad, validación

### INTRODUCCIÓN

Being happy is one of the most important motivations of human beings, and the main reason for all their actions, which is why contributing to people's happiness should be the axis of all governmental and organizational policies. From a conceptual point of view, happiness has been associated with eudaimonic factors, which are related to the purpose of life, and hedonic factors, which are related to the enjoyment of life. It has also been related to other factors of a cognitive, affective and other nature related to the subject's life.

Personal happiness can be considered as the most desired thing for people, as well as the implicit goal of every human endeavor and goal. As such, happiness has been a central focus of philosophical thought throughout the centuries and remains today a primary topic of personal concern and social significance (Fordyce, 1985, 1988). As cited by Velado (2014, p. 4),

according to the Greek philosopher Aristotle, happiness is the only thing worth achieving in this life. However, since happiness as a state of well-being is subject to many events, some of them unfortunate that are beyond the control of people, it can be indicated that this state of well-being is futile (Moccia, 2016).

In light of the above, it follows that the degree of happiness that a person has depends on the balance of the number of situations that make them happy and those that do not. According to what is described by Diener (1984) there are different conceptions that try to explain the happiness and well-being of people. In accordance with this author, on the one hand, happiness can be characterized on the basis of external criteria such as virtue or grace; on the other hand, it also takes into account the person's own evaluation of their life in positive terms, or the preponderance of positive affects over the negative affects felt by the person. These last two aspects, life satisfaction and positive affect, are used by researchers of subjective well-being and subjective happiness.

In this regard, research on happiness typically reports on life satisfaction and other hedonic measures (positive or negative affect derived from immediate experiences and overall life satisfaction), and can be assessed globally (general life satisfaction) or as a local assessment relative to particular domains of life that may be affected by current events (e.g., family, friends, health, work, etc.) (Pfeiffer & Cloutier, 2016). Another aspect that is related to happiness, is self-fulfillment and purpose in life, or eudaemonic sense, which, although little affected by recent situations (Pfeiffer & Cloutier, 2016), can condition people's psychological well-being (Robak & Griffin, 2000).

In this sense, the work of Diener and Diener (1995) provides interesting findings on life satisfaction and self-esteem, and other variables such as satisfaction with friends, family, and financial situation, based on a sample of 13118 university students from 31 countries. Overall, the results reported by these authors indicate that life satisfaction was moderately to strongly and significantly correlated with satisfaction with friends, family, and financial situation. In another study by Robak and Griffin (2000), in a sample of 188 college students, they found that purpose in life correlated significantly and positively with happiness and negatively with depression. Given the relationship between subjective well-being, meaning in life and happiness, it is necessary for happiness models to incorporate aspects that immediately affect people's state of well-being, as well as other more far-reaching aspects that have to do with the individual's fulfillment in different domains.

Thus, some researchers such as Lyubomirsky (2001) suggest that in order to understand why some people are happier than others, it is necessary to understand the cognitive and motivational processes that serve to maintain, and even enhance, lasting happiness and transitory mood. Lyubomirsky et al. (2005) conducted a review of cross-sectional, longitudinal and experimental studies, from which empirical evidence is drawn to support the following: a) happier people tend to want to help others and to participate in community-type activities; b) friendship has a high positive correlation with people's self-reported happiness, and is a strong predictor even above contact with relatives, and c) happiness is associated with people's reported health status.

According to the above, the importance for human beings of having general conditions that allow them to be happy, this research evaluates an instrument for the estimation of

happiness, called the Sophie Model or Modelo Sophie, developed by the authors of this paper, on a conceptual basis that takes into account hedonic and eudaemonic aspects, and which form a model that can be adjusted and approximated to a scale that allows the estimation of a person's degree of happiness. The model presented here is of a conceptual type, since it was designed by researchers (taking into account the existing literature) to try to assess the level of happiness of individuals (Moreira et al., 2002). Given that models capture in a simplified way some important aspects of the reality they attempt to represent (Adúriz-Bravo & Izquierdo-Aymerich, 2009), the model presented here considers some elements that allow describing the level of happiness in certain factors.

It is expected, based on the results of the application of the instrument, to build a valid instrument for Spanish-speaking people, for further studies, where happiness is a variable to be considered, as in the case of the implementation of public policies (Layard, 2006; Musikanski, 2014), or application of strategies for personnel management in companies to improve the happiness of individuals (Awada & Ismail, 2019).

In contrast to the above, Jalloh (2014) mentions that different scales have been used to assess happiness, such as the Life Satisfaction Scale by Diener et al. (1985) with five items; the 29-item Oxford Happiness Questionnaire by Hills and Argyle (2003); the Single-Item Happiness Measure by Abdel-Khalek (2006); and the Subjective Happiness Scale by Lyubomirsky and Lepper (1999). These instruments have been developed in English and have adequate psychometric properties consistent with the model used in their construction, but they do not address key aspects of happiness, such as those mentioned in previous paragraphs.

For this reason, the proposed instrument incorporates some dimensions that were not considered in other instruments of this type. Apart from the aforementioned instruments, we can mention the Happiness Scale for Adults (Moyano et al., 2018) which contains 21 items and four dimensions: psychological state, having family, achievement orientation and optimism. There is also the Factor Scale for measuring happiness (Alarcón, 2006) which is made up of 27 items and four dimensions: positive sense of life, satisfaction with life, personal fulfillment and joy of living. Therefore, the Sophie Model not only contains factors equivalent to these instruments, but also incorporates food, health and physical activity as weight elements of a happy person.

## **MATERIALS AND METHODS**

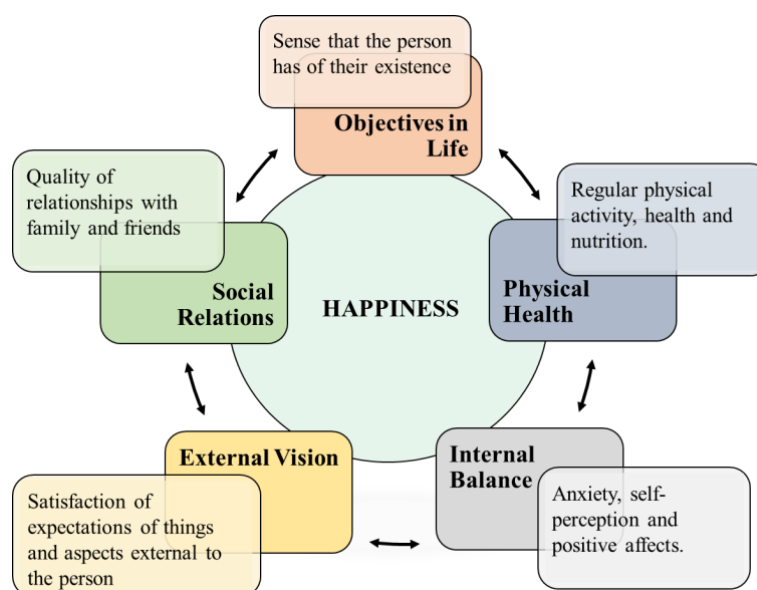
As previously commented, the Sophie Model (see Table 1 and Figure 1) is an instrument designed to assess happiness, which consists of five dimensions that the literature has shown to correlate significantly with happiness: friendship (Demir & Davidson, 2013) and family (North et al., 2008) that make up the social dimension; life goals and inner balance (Li et al., 2019); physical health (Steptoe, 2019) and external view of life (Kwon et al., 2021; Tsui, 2014). Additionally, the review conducted by Lyubomirsky et al. (2005), who gather in their review relevant information on factors that correlate with happiness and well-being, was taken into account.

Table 1. Definition of the Sophie Model dimensions

| Dimension                 | Definition   |
|---------------------------|--|
| <b>Social relations</b>   | Quality of the positive affective relationships that the person establishes with family and friends, and other close people. |
| <b>Objectives in Life</b> | A person's awareness that their life has a purpose and that they have the conditions to carry it out.                        |
| <b>Internal balance</b>   | Predominance of positive affect, self-esteem, low anxiety and stress, and optimism.  |
| <b>External vision</b>    | Satisfaction of expectations at the material, economic and living place level.   |
| <b>Physical health</b>    | Perception of the person's state of health, regular physical activity and healthy eating habits.                             |

In relation to the above, each of the dimensions of the Sophie Model are related and affect each other (see Figure 1), which increases the complexity of the evaluation of a person's happiness.

Figure 1. Diagram of the Sophie Model, showing the five dimensions of the happiness construct.



### Participants

For the statistical evaluation of the instrument, it was applied to two samples of people. The first sample consisted of 417 inhabitants of Nicaragua (Universidad del Valle; mean age 24.3 years, SD = 9.5 years; 60% female) and was made up as follows: 294 university students (mean age 20.2 years, SD = 3.6 years), 49 university teachers (mean age 41.1 years, SD = 12.3 years), 49 professionals of different types (mean age 30.0 years, SD = 9.0 years) and 25 people with other occupations (mean age 28.6 years, SD = 8.9 years). The second sample consisted of 71 inhabitants of Colombia (Universidad Central del Valle del Cauca; mean age 29.2 years, SD = 13.4 years, 51% female): 45 university students (mean age 22.4 years, SD = 7.8 years), 22

teachers (mean age 45.7 years, SD = 11.0 years) and 4 from other occupations (mean age 29.2 years, SD = 3.2 years). All data were collected using the Google Forms platform.

### Procedure

The content validity of the instrument was carried out by a group of three experts, who reviewed each of the 78 initial items proposed, their wording and pertinence in terms of the construct of happiness, their validity and the dimension to which they belong. A 5-point Likert-type scale ranging from "Strongly disagree" to "Strongly agree" was used as responses to questions such as "I have a very close relationship with my family" shown in Table 2, which contains the final items that are part of the model.

Table 2. Items that conform the proposed instrument to evaluate happiness.

|    |  |
|----|--|
| 1  | I am clear about my goals in life                                      |
| 2  | I practice physical activity on a regular basis                        |
| 3  | I have a close relationship with my family                             |
| 4  | I feel happy with my family  |
| 5  | I consider myself to have a balanced diet                              |
| 6  | I consider myself an optimistic person                                 |
| 7  | Having friends makes me happy  |
| 8  | I feel developed professionally  |
| 9  | On a material level, I have everything I need                          |
| 10 | I contribute to the happiness of others                                |
| 11 | I regularly eat several pieces of fresh fruit and vegetables every day |
| 12 | I almost always see the good side of things                            |
| 13 | I feel that I am the person I want to be                               |
| 14 | I am usually kind to others  |
| 15 | I am clear about my purpose in life                                    |
| 16 | I have a close relationship with my friends                            |
| 17 | I feel developed as a person   |
| 18 | I feel physically healthy  |
| 19 | I usually feel inner peace   |
| 20 | I feel that on a material level I have everything I would like to have |
| 21 | I have fulfilled the life goals I have set for myself                  |
| 22 | I am regularly in contact with nature and do outdoor activities        |
| 23 | I always consider new projects to continue growing on a personal level |
| 24 | I am interested in the people around me                                |
| 25 | I have a close-knit family   |
| 26 | I always count on the support of my family and loved ones              |
| 27 | I regularly eat foods rich in fiber, such as whole grains and legumes. |
| 28 | I am usually very grateful with life.                                  |
| 29 | I feel very good financially and economically                          |
| 30 | My friends listen to me and are there for me when I need them          |
| 31 | I consider myself an altruistic person. I give myself to others        |
| 32 | I value myself highly, and feel I am unique and extraordinary          |

For the selection of the items that will be in the final model, an exploratory factor analysis was applied to each of the subscales assuming one dimension for each of them; in this way the items that were part of the final factor analysis were selected, all under the same

conditions mentioned below. For the preliminary selection of the items, we also accounted for the item-test correlation, the discrimination index (25th and 75th quartiles) and the MSA (Measure of Sampling Adequacy) value (Pere et al., 2022).

### Statistical Analysis

The main statistics (mean and standard deviation) were obtained, and a factor analysis was applied to the items (Pere et al., 2022) and the main indicators of fit to the proposed model were calculated (RMSEA, NNFI, CFI and RMSR). Diagonally weighted least squares was used to extract the factors; the polychoric correlation matrix was used and the prominent robust rotation algorithm (Lorenzo-Seva & Ferrando, 2019). For the inclusion of items in a factor, it had to saturate at least 0.4 and belong to a single factor. The internal consistency of the test, to the factorial solutions obtained, was performed by calculating Cronbach's Alpha. To contrast the results of this instrument, the Subjective Happiness Scale of Lyubomirsky and Lepper (1999) was used. Factor Analysis (Ferrando & Lorenzo-Seva, 2017) and SPSS 26 for Windows will be used for data processing.

### RESULTS

The values of the sample adequacy index obtained above 0.9 are appropriate for the subsequent factor analysis performed (Table 3). In relation to the other indicators shown in Table 2 (RMSEA, NNFI, CFI, RMSR), the values obtained for the five-factor model initially proposed with respect to the conceptual structure of the instrument are appropriate, which corroborates the dimensions present in the test. According to Cronbach's alpha value, the instrument is reliable, since the values obtained are greater than 0.7 (Oviedo & Campo-Arias, 2005).

**Table 3.** Values of the indicators obtained for the Sophie Model

| Number of Factors | Indicators |       |       |       |        |          |
|-------------------|------------|-------|-------|-------|--------|----------|
|                   | KMO        | RMSEA | NNFI  | CFI   | RMSR   | $\alpha$ |
| 5                 | 0.912      | 0.019 | 0.997 | 0.998 | 0.0469 | 0.933    |

*Note.* KMO, Kaiser-Meyer-Olkin sample adequacy index; RMSEA, *Root Mean Square Error of Approximation*: 0, exact solution; < 0.05 good model fit; < 0.08 acceptable model; > 0.1, inadequate model (Browne & Cudeck, 1992; Harrington, 2009). NNFI, *Non-Normed Fit Index*: > 0.95, adequate model (Ruiz et al., 2010). CFI, *Comparative Fit Index*: > 0.95, adequate model (Ruiz, et al., 2010). RMSR, *Root Mean Square of Residuals*: Close to 0.08 or lower (Harrington, 2009). Cronbach's alpha ( $\alpha$ )

Table 4 shows the overall average values for each of the subscales of the Sophie Model. According to the results of Cronbach's  $\alpha$ , each of the subscales has an acceptable reliability.

Table 4. Mean values, standard deviation and reliability of the subscales of the Sophie Model.

| Subscales                               | Items     | M (SD)             | $\alpha$ |
|---|-----------|--------------------|----------|
| Family                                  | 4         | 3.82 (1.02)        | 0.857    |
| Friends                                 | 7         | 3.87 (0.74)        | 0.814    |
| Objectives in Life and Internal Balance | 12        | 3.73 (0.84)        | 0.923    |
| External Vision                         | 3         | 3.22 (1.01)        | 0.811    |
| Physical Health                         | 6         | 3.01 (0.92)        | 0.812    |
| <b>Total</b>                            | <b>32</b> | <b>17.7 (3.29)</b> | <b>-</b> |

According to the correlation analysis performed (Table 5), the Sophie Model values correlate positively and significantly with each of the five subscales and with the Subjective Happiness Scale (Lyubomirsky & Lepper, 1999), suggesting that the Sophie Model is an estimator of happiness. Age also correlates positively and significantly with Sophie test scores, and with the rest of subscales.

**Table 5.** Correlation (rs) between the values of the Sophie Model, with the five subscales, the Subjective Happiness Scale and age.

|   | 2       | 3       | 4       | 5       | 6       | 7       | 8       |
|---|---------|---------|---------|---------|---------|---------|---------|
| 1 | 0.366** | 0.351** | 0.359** | 0.462** | 0.717** | 0.461** | 0.235** |
| 2 |         | 0.325** | 0.351** | 0.516** | 0.640** | 0.427** | 0.098*  |
| 3 |         |         | 0.375** | 0.487** | 0.700** | 0.415** | 0.128** |
| 4 |         |         |         | 0.571** | 0.724** | 0.365** | 0.179** |
| 5 |         |         |         |         | 0.809** | 0.666** | 0.334** |
| 6 |         |         |         |         |         | 0.623** | 0.257** |
| 7 |         |         |         |         |         |         | 0.285** |

Note. rs, Spearman's Rho; 1, Family; 2, Friend; 3, External Vision; 4, Physical Health; 5, Life Purpose and Internal Balance; 6, Sophie Model; 7, Subjective Happiness Scale; 8, Age; \*, correlation is significant at  $p < 0.05$  level; \*\*, correlation is significant at  $p < 0.001$  level.

Table 6 shows the mean values for the Sophie Model and its five subscales, and the subjective happiness scale. Considering occupation as a categorical variable, statistically significant differences were found for the Sophie Model scores [ $F(3;413) = 13.45, p < 0.001$ ] and for the subjective happiness scale scores. Post hoc tests indicated that teachers and professionals are happier than students ( $p < 0.05$ ), according to the scores of both instruments. On the other hand, it was found that men are happier than women ( $t = 2.40, p = 0.017$ ) according to what was obtained by the Sophie Model, but such difference is not significant with the subjective happiness scale.



**Table 6.** Mean values (standard deviation) for the Sophie Model, the five subscales and the Subjective Happiness Scale in Nicaragua.

|                   | 1           | 2           | 3           | 4           | 5           | 6            | 7           |
|-------------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|
| <b>Occupation</b> |             |             |             |             |             |              |             |
| Teacher           | 4.31 (0.86) | 4.12 (0.64) | 3.56 (0.90) | 3.34 (0.85) | 4.33 (0.51) | 19.66 (2.58) | 5.64 (0.81) |
| Student           | 3.71 (0.98) | 3.78 (0.74) | 3.14 (1.03) | 2.90 (0.90) | 3.55 (0.84) | 17.09 (3.25) | 4.62 (1.13) |
| Professional      | 4.04 (1.15) | 4.21 (0.66) | 3.42 (0.95) | 3.34 (0.96) | 4.14 (0.65) | 19.15 (3.13) | 5.40 (1.00) |
| Other             | 3.71 (1.16) | 3.75 (0.75) | 3.15 (0.83) | 3.07 (0.95) | 3.91 (0.80) | 17.59 (2.99) | 4.96 (1.12) |
| <b>Gender</b>     |             |             |             |             |             |              |             |
| Female            | 3.81 (1.06) | 3.82 (0.75) | 3.15 (1.04) | 2.93 (0.97) | 3.63 (0.88) | 17.3 (3.42)  | 4.80 (1.15) |
| Male              | 3.84 (0.94) | 3.94 (0.71) | 3.33 (0.95) | 3.13 (0.84) | 3.88 (0.75) | 18.1 (3.04)  | 4.93 (1.13) |

*Note.* 1, Family; 2, Friends; 3, External Vision; 4, Physical Health; 5, Objectives in life and Internal Balance; 6, Sophie Model; 7, Subjective Happiness Scale; Mean (standard deviation).

Table 7 shows the results obtained for the Colombian sample, where no statistically significant differences were found in the values of the Sophie Model and the Subjective Happiness Scale. taking into account the occupation of the participants and gender ( $p > 0.05$ ).

**Table 7.** Mean values (standard deviation) of the Sophie Model, the five subscales and the Subjective Happiness Scale in Colombia.

|                   | 1           | 2           | 3           | 4           | 5           | 6            | 7           |
|-------------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|
| <b>Occupation</b> |             |             |             |             |             |              |             |
| Teacher           | 4.45 (0.67) | 4.30 (0.43) | 3.88 (0.73) | 3.44 (0.74) | 4.40 (0.45) | 20.47 (2.16) | 5.55 (0.86) |
| Student           | 4.02 (0.86) | 3.90 (0.65) | 3.43 (1.04) | 3.31 (1.05) | 3.95 (0.81) | 18.62 (3.19) | 5.13 (1.07) |
| Others            | 4.25 (0.61) | 3.86 (0.72) | 3.92 (0.99) | 3.13 (0.50) | 4.27 (0.42) | 19.42 (2.77) | 5.19 (0.66) |
| <b>Gender</b>     |             |             |             |             |             |              |             |
| Female            | 4.11 (0.79) | 3.99 (0.55) | 3.58 (0.93) | 3.18 (0.90) | 4.12 (0.70) | 19.2 (2.90)  | 5.25 (1.05) |
| Male              | 4.23 (0.83) | 4.06 (0.68) | 3.61 (1.01) | 3.50 (0.95) | 4.10 (0.75) | 19.3 (3.10)  | 5.27 (0.95) |
| <b>Total</b>      | 4.17 (0.81) | 4.02 (0.61) | 3.60 (0.97) | 3.34 (0.93) | 4.11 (0.72) | 19.2 (2.98)  | 5.26 (1.00) |

*Note.* 1, Family; 2, Friends; 3, External Vision; 4, Physical Health; 5, Objectives in Life and Internal Balance; 6, Sophie Model; 7, Subjective Happiness Scale; Mean (standard deviation)

The overall mean and standard deviation of the Sophie Model scores for the Nicaraguan sample was 17.7, SD = 3.29 (N = 417), while for the Colombian sample it was 19.2, SD = 2.98 (N = 71). In the case of the Subjective Happiness Scale, the same data are: for Nicaragua, 4.85, SD = 1.14, and for Colombia 5.26, SD = 1.00. According to the values of these two instruments, the Colombian sample is happier than the Nicaraguan sample, with the Sophie Model ( $t = 3.77$ ,  $p < 0.001$ ) and the Subjective Happiness Scale ( $Z = -2.652$ ,  $p = 0.008$ ).

## DISCUSSION

The Sophie Model, which is an instrument designed to provide a quantitative estimate of happiness, through a theoretical structure that gives special importance to five dimensions: family, friends, purpose in life and internal balance, external vision and physical health, as predictors of happiness. The adequacy of the items to the proposed dimensions and the adequacy indices found (Table 3), provide statistical support to the model, whose stability and

reproducibility can be tested in subsequent studies. Since this is the first version of the test, its usefulness was tested by applying it to communities of university students (teachers, students and other professionals), to provide initial data in relation to the instrument and its subscales, where it is shown that it produces results that are related to consolidated tests for the evaluation of subjective happiness and allows discriminating between levels of happiness for different groups.

The relevance of the dimensions proposed in the construct of happiness is corroborated by the correlation analysis that shows that the five dimensions correlate positively and significantly with the Subjective Happiness Scale. In relation to these findings, in a study by Azizi et al. (2017) concluded that good relationships with family, relatives and friends, are the main factors affecting Happiness. Similarly, Mehrdadi et al. (2016) found that among other factors, physical activity and place of residence are associated with happiness in young people. In another study, it was reported that adolescents who exercise frequently become more socially adept, which in turn could make them happier (Cheon, 2021).

In this study, a significant difference was found in the level of happiness assessed with the Sophie Model and with the Subjective Happiness Scale. To explain this, some studies that relate various aspects to happiness can be considered. For example, it is known that although economic prosperity and culture are positively correlated with happiness, only the former does so consistently (Schyns, 1998). On the other hand, it has been indicated that other factors that are also related to happiness are good government, health or the quality of the city where one lives (Oishi & Gilbert, 2016). Other aspects such as climate and environmental quality seem to condition the degree of happiness of people (Cuñado & de Gracia, 2013). Therefore, it is difficult to explain the cause of the difference found, and further studies are needed to understand whether these differences are due to cultural reasons or to others that depend on the socioeconomic and political context of both nations.

## CONCLUSIONS

The instrument designed to provide a quantitative estimate of happiness has shown to have a factor structure consistent with the underlying theoretical structure and correlates significantly with the Subjective Happiness Scale. The model considering the five dimensions (Friends, Family, Physical Health, External Vision, and Objectives in Life and Internal Balance), has adequate fit indices for the short and long versions of the instrument. The application of the instrument to the sample of inhabitants of Nicaragua and Colombia allowed us to obtain the first values of the instrument, which can be useful to establish the impact of policies and plans at different levels on the degree of general well-being and happiness of people.

Since this is a first version of the instrument, its subsequent application to a sample with a more diverse composition will allow both its refinement and possible improvement, which will contribute to a better estimation of the construct of happiness in adults, and with the respective adaptations to children and adolescents.

## REFERENCIAS

- Abdel-Khalek, A. (2006). Measuring Happiness with a Single-Item Scale. *Social Behavior and Personality: an international journal*, 34(2), 139-150. <https://doi.org/10.2224/sbp.2006.34.2.139>
- Adúriz-Bravo, A., & Izquierdo-Aymerich, M. (2009). Un modelo de modelo científico para la enseñanza de las ciencias naturales. *Revista Electrónica de Investigación en Educación en Ciencias, Nro. Especial 1*, 40-49.
- Alarcón, R. (2006). Desarrollo de una Escala Factorial para Medir la Felicidad. *Revista Interamericana de Psicología*, 40(1), 99-106.
- Awada, N., & Ismail, F. (2019). Happiness in the Workplace. *International Journal of Innovative Technology and Exploring Engineering*, 8(9S3), 1496-1500. <https://doi.org/10.35940/ijitee.I3313.0789S319>
- Azizi, M., Mohamadian, F., Ghajarieah, M., & Direkvand-Moghadam, A. (2017). The Effect of Individual Factors, Socioeconomic and Social Participation on Individual Happiness: A Cross-Sectional Study. *Journal of Clinical and Diagnostic*, 11(6), VC01-VC04. <https://doi.org/10.7860/JCDR/2017/24658.9982>
- Browne, M. W., & Cudeck, R. (1992). Alternative Ways of Assessing Model Fit. *Sociological Methods & Research*, 21(2), 230-258. <https://doi.org/10.1177/0049124192021002005>
- Cheon, H. (2021). The Structural Relationship between Exercise Frequency, Social Health, and Happiness in Adolescents. *Sustainability*, 13(3), 1050. <https://doi.org/10.3390/su13031050>
- Cuñado, J., & de Gracia, F. P. (2013). Environment and Happiness: New Evidence for Spain. *Social Indicators Research*, 112(3), 549-567. <https://doi.org/10.1007/s11205-012-0038-4>
- Demir, M., & Davidson, I. (2013). Toward a Better Understanding of the Relationship Between Friendship and Happiness: Perceived Responses to Capitalization Attempts, Feelings of Mattering, and Satisfaction of Basic Psychological Needs in Same-Sex Best Friendships as Predictors of Happiness. *Journal of Happiness Studies*, 14(2), 525-550. <https://doi.org/10.1007/s10902-012-9341-7>
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, 95(3), 542-575. <https://doi.org/10.1037/0033-2909.95.3.542>
- Diener, E., & Diener, M. (1995). Cross-cultural correlates of life satisfaction and self-esteem. *Journal of Personality and Social Psychology*, 68(4), 653-663. <https://doi.org/10.1037/0022-3514.68.4.653>
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment*, 49(1), 71-75. [https://doi.org/10.1207/s15327752jpa4901\\_13](https://doi.org/10.1207/s15327752jpa4901_13)
- Ferrando, P. J., & Lorenzo-Seva, U. (2017). Program FACTOR at 10: Origins, development and future directions. *Psicothema*, 29(2), 236-241. <https://doi.org/10.7334/psicothema2016.304>
- Fordyce, M. W. (1985). The Psychap inventory: A multi-scale test to measure happiness and its concomitants. *Social Indicators Research*, 18(1), 1-33. <https://doi.org/10.1007/BF00302530>
- Fordyce, M. W. (1988). A review of research on the happiness measures: A sixty second index of happiness and mental health. *Social Indicators Research*, 20(4), 355-381. <https://doi.org/10.1007/BF00302333>
- Harrington, D. (2009). *Confirmatory Factor Analysis*. Oxford University Press, USA.
- Hills, P., & Argyle, M. (2002). The Oxford Happiness Questionnaire: A compact scale for the measurement of psychological well-being. *Personality and Individual Differences*, 33(7), 1073-1082. [https://doi.org/10.1016/S0191-8869\(01\)00213-6](https://doi.org/10.1016/S0191-8869(01)00213-6)
- Jalloh, A. (2014). Measuring Happiness: Examining Definitions and Instruments. *Illuminare: A Student Journal in Recreation, Parks, and Leisure Studies*, 12, 59-67.
- Kwon, O.-H., Hong, I., Yang, J., Wohn, D. Y., Jung, W.-S., & Cha, M. (2021). Urban green space and happiness in developed countries. *EPJ Data Science*, 10(1), 28. <https://doi.org/10.1140/epjds/s13688-021-00278-7>
- Layard, R. (2006). Happiness and Public Policy: A Challenge to the Profession. *The Economic Journal*, 116(510), C24-C33. <https://doi.org/10.1111/j.1468-0297.2006.01073.x>
- Li, P. F. J., Wong, Y. J., & Chao, R. C.-L. (2019). Happiness and meaning in life: Unique, differential, and indirect associations with mental health. *Counselling Psychology Quarterly*, 32(3-4), 396-414. <https://doi.org/10.1080/09515070.2019.1604493>
- Lorenzo-Seva, U., & Ferrando, P. J. (2019). Robust Promin: A method for diagonally weighted factor rotation. *LIBERABIT. Revista Peruana de Psicología*, 25(1), 99-106. <https://doi.org/10.24265/liberabit.2019.v25n1.08>
- Lyubomirsky, S. (2001). Why are some people happier than others? The role of cognitive and motivational processes in well-being. *American Psychologist*, 56(3), 239-249. <https://doi.org/10.1037/0003-066X.56.3.239>
- Lyubomirsky, S., King, L., & Diener, E. (2005). The Benefits of Frequent Positive Affect: Does Happiness Lead to Success? *Psychological Bulletin*, 131(6), 803-855. <https://doi.org/10.1037/0033-2909.131.6.803>

- Lyubomirsky, S., & Lepper, H. S. (1999). A measure of subjective happiness: Preliminary reliability and construct validation. *Social Indicators Research*, 46(2), 137-155. <https://doi.org/10.1023/A:1006824100041>
- Mehrdadi, A., Sadeghian, S., Direkvand-Moghadam, A., & Hashemian, A. (2016). Factors Affecting Happiness: A Cross-Sectional Study in the Iranian Youth. *Journal of Clinical and Diagnostic Research*, 10(5), VC01-VC03. <https://doi.org/10.7860/JCDR/2016/17970.7729>
- Moccia, S. (2016). Felicidad en el trabajo. *Papeles del Psicólogo*, 37(2), 143-151.
- Moreira, M., Greca, I., & Rodriguez, M. (2002). Modelos conceptuales y modelos conceptuales en la enseñanza & aprendizaje de las ciencias. *Revista Brasileira de Pesquisa em Educação em Ciências*, 2(3), 37-57.
- Moyano, E., Dinamarca, D., Mendoza-Llanos, R., & Palomo-Vélez, G. (2018). Escala de Felicidad para Adultos (EFPA). *Terapia psicológica*, 36(1), 37-49. <https://doi.org/10.4067/s0718-48082017000300033>
- Musikanski, L. (2014). Happiness In Public Policy. *Journal of Social Change*, 6(1), 55-85.
- North, R. J., Holahan, C. J., Moos, R. H., & Cronkite, R. C. (2008). Family support, family income, and happiness: A 10-year perspective. *Journal of Family Psychology*, 22(3), 475-483. <https://doi.org/10.1037/0893-3200.22.3.475>
- Oishi, S., & Gilbert, E. A. (2016). Current and future directions in culture and happiness research. *Current Opinion in Psychology*, 8, 54-58. <https://doi.org/10.1016/j.copsyc.2015.10.005>
- Oviedo, H., & Campo-Arias, A. (2005). Aproximación al uso del coeficiente alfa de Cronbach. *Revista Colombiana de Psiquiatría*, 34(4). [http://www.scielo.org.co/scielo.php?script=sci\\_arttext&pid=S0034-74502005000400009](http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0034-74502005000400009)
- Pere, F., Lorenzo-Seva, U., Hernández-Dorado, A., & Muñoz, J. (2022). Decálogo para el Análisis Factorial de los Ítems de un Test. *Psicothema*, 34(1), 7-17.
- Pfeiffer, D., & Cloutier, S. (2016). Planning for Happy Neighborhoods. *Journal of the American Planning Association*, 82(3), 267-279. <https://doi.org/10.1080/01944363.2016.1166347>
- Robak, R. W., & Griffin, P. W. (2000). Purpose in life: What is its relationship to happiness, depression, and grieving? *North American Journal of Psychology*, 2(1), 113-119.
- Ruiz, M., Pardo, A., & San Martín, R. (2010). Modelo de Ecuaciones Estructurales. *Papeles del Psicólogo*, 31(1), 34-45.
- Schyns, P. (1998). Crossnational Differences in Happiness: Economic and Cultural Factors Explored. *Social Indicators Research*, 43(1), 3-26. <https://doi.org/10.1023/A:1006814424293>
- Steptoe, A. (2019). Happiness and Health. *Annual Review of Public Health*, 40(1), 339-359. <https://doi.org/10.1146/annurev-publhealth-040218-044150>
- Tsui, H.-C. (2014). What affects happiness: Absolute income, relative income or expected income? *Journal of Policy Modeling*, 36(6), 994-1007. <https://doi.org/10.1016/j.jpolmod.2014.09.005>
- Velado, L. A. (2014). Filosofía y psicología de la felicidad: Aplicaciones educativas. *Educación y Futuro Digital*, 9 (Mayo), 3-16.