Development of the Greek version of the Spiritual Intelligence Self-Report Inventory-24 (KAPN): Factor structure and validation

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Abstract

The Spiritual Intelligence Self-Report Inventory 24 (SISRI-24) is widely used to assess spiritual intelligence (SI) in general population samples. The current study explored the Greek version SISRI-24 factor structure in a convenience sample of 1777 adults. A translation of the original scale was performed in different stages, so as to obtain a fully comprehensible and accurate equivalent. Psychometric properties were analyzed at the level of item. The four-factor solution proposed in the original SISRI-24 was not confirmed. Instead, an alternative model, in which the SISRI-24 structure was revised and trimmed to a final 3-factor, 17-item short-form version (KAPN), produced an instrument of sound construct validity [fit indices: CFI=.92, TLI=.91, RMSEA=.06, SRMR=.06] and robust internal consistency for the questionnaire. The results are sufficient for endorsing the suitability of KAPN in Greek speaking populations, and extend cross-cultural support for the SI model. Implications and recommendations for future directions of research are discussed.

Keywords: spiritual intelligence; Spiritual Intelligence Self-Report Inventory 24 - SISRI-24; Greek translation; factor structure

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Although the construct of spirituality poses a conceptual and psychometric challenge for contemporary researchers (Kapuscinski & Masters, 2010), it is increasingly acknowledged as an essential aspect of human identity and diversity in a variety of situations, including physical health and illness (Steinhauser et al., 2017), mental health and distress (Forrester-Jones, Dietzfelbinger, Stedman, & Richmond, 2018; Weber & Pargament, 2014), strength-based models (i.e. quality-of-life, resilience) (Panzini et al., 2017), psychotherapeutic (Captari et al., 2018), organizational (Anbugeetha, 2015) and educational (Ault, 2010) contexts. As a matter of fact, the importance of religion and/or spirituality (R/S) has entered the realm of policy-making worldwide, further confirming this field of exploration as a legitimate focus of broader concern (Bigger, 2008; Forrester-Jones et al., 2018; Giannone & Kaplin, 2017; Sango & Forrester-Jones, 2014).

The latest edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5 American Psychiatric Association, 2013) brought a radical change into the understanding of the implications of R/S, by introducing the *Religious or Spiritual Problems* (v-code 62.89) diagnostic category. Furthermore, the Association of American Medical Colleges (AAMC), the World Health Organization (WHO), and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) all now include spirituality in medical practice and education (Anandarajah, 2008; Association of American Medical Colleges, 1999; WHOQOL SRPB Group, 2006). Likewise, the Position Statement on Religion and Spirituality in Psychiatry, published by the WPA Executive Committee (Moreira-Almeida, Sharma, van Rensburg, Verhagen, & Cook, 2016), set a definitive point of recognition and professional commitment to R/S concerns in mainstream encounters (Abu-Raiya, 2017).

The WPA defines spirituality as "a dimension of human experience related to the transcendent, the sacred, or to ultimate reality. It is closely related to values, meaning and purpose in life. It may develop individually or in communities and traditions" (Moreira-Almeida et al., 2016, p. 87). Spiritual intelligence (SI) emerged as a result of integrating intelligence with spirituality (Mahasneh, Shammout, Alkhazaleh, Al-Alwan, & Abu-Eita, 2015) so as to produce an operationalized construct, as had been suggested in the past by researchers such as Gardner (1999), Emmons (2000), Zohar and Marshall (2001), and Vaughan (2003), who introduced the concept of SI in reference to a set of mental mechanisms of one's spiritual understanding of life, thought to underlie and inform our repositories of spirituality (Polemikou & Vantarakis, 2019). Later on, David King addressed the pressing need for the development of a concrete assessment tool regarding the contribution of spirituality in a wide array of potential applications (King, 2008; King & Decicco, 2009). He described SI as "*a set of mental capacities which contribute to the awareness, integration, and adaptive application of the nonmaterial and transcendent aspects of one's existence*, leading to such outcomes as deep existential reflection, enhancement of meaning, recognition of a transcendent self, and mastery of spiritual states" (King, 2008, p. 56; original italics). Based on this view, he devised a robust psychometric SI model and introduced the Spiritual Intelligence Self-Report Inventory – 24 (SISRI-24), which is nowadays considered amongst the soundest tools for measuring this human capacity. SISRI-24 is designed to measure skills related to one's ability to adapt and apply spiritual qualities and experiences, so as to engage in ontological problem-solving in everyday life.

At the present time, SISRI-24 has not yet been translated/validated in Greece, although the instrument has shown adequate psychometric qualities cross-culturally, in countries such as Portugal, India, China, Iran, and Jordan (Anbugeetha, 2015; Antunes, Silva, & Oliveira, 2018; Chang & Siu, 2016; Khodadady & Moosavi, 2014; Mahasneh et al., 2015). With this in mind, we aimed to translate and adapt the original SISRI-24 into Greek, so as to (i) corroborate its factorial

structure, (ii) explore its internal consistency, and (iii) evaluate its convergent validity by checking its associations with the NonReligious-NonSpiritual Scale (NRNSS**;** Cragun, Hammer, & Nielsen, 2015; name deleted to maintain the integrity of the review process), the Meaning in Life Questionnaire (MLQ; Steger, Frazier, Oishi, & Kaler, 2006) and the Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003), so as to ensure that the adapted scale satisfied the measurement properties needed for its intended application.

Method

Procedure and Participants

Survey participation yielded 1794 respondents, obtained through convenience sampling. In addition to online adverts, participants were approached at University campuses and Lifelong Learning Centers across Greece (in Athens, Thessaloniki, Mytilene and Rhodes). Instruments were either completed electronically, or by pen and paper. Omitted SISRI-24 data exceeding 5% of total values were identified in 17 (.95%) participants, and were removed from further analysis, resulting in a final dataset of 1777 cases. Little's (1988) MCAR test, used to examine whether values were missing completely at random, was non-significant (χ^2 = 288.75, p = .28), suggesting values were missing entirely by chance. For the remainder, missing values did not exceed 2%. Multivariate imputation by chained equations (MICE) was employed to deal with missing data.

We randomly split the cohort (N = 1777) into two smaller samples (n_1 = 888; n_2 = 889) using the "sample" function in *R* studio, which employs a random generator algorithm. Cross-validation through sample-splitting allows robust inferences regarding the factorial structure of the scale being studied (Brown, 2015; Byrne, 2016). We then conducted an Exploratory Factor Analysis (EFA) in sample n_1, followed by model testing in the form of Confirmatory Factor Analysis (CFA) in n_2.

Sample 1. Average participation age was 33.18 years (SD = 12.58, range = 18-76), of female majority (673; 75.79%). Most subjects identified with a Christian religious denomination (73.76%), followed by spiritual (2.70%), "other" (2.82%), Buddhism (.56%), Judaism (.11%), whereas 19.71% did not ascribe to a specific religion. Additionally, 517 (58.22%) subjects reported belief and 183 (20.61%) nonbelief in God or higher power, whereas 187 (21.05%) disclosed uncertainty.

Sample 2. Average participation age was 33.41 years (SD = 12.45, range = 18-73), of female majority (662; 74.47%). Again, Christianity (70.19%) presided of other religious denominations: spiritual (3.93%), "other" (3.37%), Buddhism (.56%), Islam (.34%), whereas 21.14% did not ascribe to a

specific religion. Additionally, 488 (54.90%) subjects reported belief and 195 (21.93%) nonbelief in God or higher power, whereas 204 (22.95%) disclosed uncertainty.

The overall sample profile is described in greater detail in Supplementary Table 1.

We expected to obtain the same factor structure as in the original scale (King, 2008; King & Decicco, 2009) although cross-cultural adaptations have also reported alternative factor solutions (i.e. Antunes et al., 2018; Khodadady & Moosavi, 2014). We also hypothesized that the total score of SISRI-24 and its subscales would be positively correlated with MLQ the (which assesses *presence of* and *search for* meaning), and the CD-RISC subscales (which assess a person's stress-coping abilities in the face of adversity), lending support for the instrument's convergent validity. Further support for convergent validity would emerge if the SISRI-24 yielded inverse associations with the NRNSS nonspirituality (NS) subscale, which assesses individualistic spirituality. On the other hand, the absence of significant associations with the nonreligiousness (NR; lack of affiliation to institutional religiousness) component of the NRNSS could signify evidence of divergent validity, given that SISRI-24 is a non-denominational instrument; As such, it minimizes the likelihood of confounding spirituality with religious practices (i.e. church attendance) and situational gains (i.e. social support).

Instruments

Participants completed demographic information along with the following instruments:

SISRI-24 (King, 2008; King & Decicco, 2009)**.** Originally developed and validated in Canada, the 24-item inventory is rated along a five-point Likert scale (from 0 = *Not at all true of me* to 4 = *Completely true of me*), containing one reverse-coded item (item six). The SISRI-24 is widely used worldwide to assess a global and four constituents: ***Critical Existential Thinking*** (CET, seven items; score range 0-28) reflects one's capacity to critically engage with and contemplate on issues of an existential nature. ***Personal Meaning Production*** (PMP, five items; range 0-20), represents one's capacity to derive personal meaning and assign purpose to physical and mental experiences.

Transcendental Awareness (TA, seven items; range 0-28) measures the capacity to identify transcendent dimensions of the self and immaterial aspects of the physical world during normal states of consciousness. ***Conscious State Expansion*** (CSE, five items; range 0-20) encompasses the ability to navigate (enter/exit) higher/spiritual states of consciousness at one's own discretion. Higher global scores (0-96) connote higher SI levels (a greater capacity for specific SI skills represented by the subscales). Component scores are calculated by summing each item on the respective subscale. The original demonstrated good internal consistency across all subscales (ranging at α = .78-.91; King & Decicco, 2009), whereas in the present study α varied between .80 and .89.

NonReligious-NonSpiritual Scale (NRNSS). The NRNSS (Cragun et al., 2015) is a 16-item scale, which measures religiousness/nonreligiousness (NR) and spirituality/nonspirituality (NS) along two subscales representing one's affiliation to institutional religiousness and one's individualistic spirituality. A five-point Likert scale (1 = *strongly agree* to 5 = *strongly disagree*), yields a global between 16-80. Items 4 and 7 are reverse-coded. High scores represent strong NR/NS and low scores strong R/S. In its original form Cronbach's α was > .94 (Cragun et al., 2015), whereas the validated Greek version employed here (Polemikou, Zartaloudi, & Polemikos, 2019) - holds a global coefficient of .91 (NR/NS α = .91/.89). As a result of analysis of internal consistency, for the present study Cronbach's alpha equaled .92 (NR/NS α = .91/.90).

Meaning in Life Questionnaire (MLQ). The Greek MLQ (Steger, Frazier, Oishi, & Kaler, 2006; Greek translation from Pezirkianidis, Karakasidou, Galanakis, & Stalikas, 2016; Stalikas, Kyriazos, Yotsidi, & Prassa, 2018) comprises 10 items, rated on a seven-point scale (1 = *absolutely true* to 7 = *absolutely untrue*). Two five-item dimensions explore *Presence* and *Search* for meaning in life. The former represents the level at which respondents currently assign a valued meaning in their lives. The latter reflects the degree to which they actively explore and/or pursue an understanding life's purpose. Upon reverse-coding negative item nine, scale ratings range between 10 and 70. Steger et

al (2006) reported Cronbach's α (Presence/Search) = .81 to .86/ .84 to .92. In the current study, internal consistency was α (Presence/Search) = .84/.88.

Connor-Davidson Resilience Scale (CD-RISC). The CD-RISC (Connor & Davidson, 2003; Greek version from Dimitriadou & Stalikas, 2012) measures one's self-disclosed ability to cope and recover from stress. Twenty five items are arranged in five lower-order constituents: (i) personal competence, high standards and tenacity, (ii) trust in one's instincts, tolerance of negative affect, and strengthening effects of stress, (iii) positive acceptance of change and secure relationships, (iv) control, and (v) spiritual influences. A five-point scale (0-4) leads to a total score range of 40-125. Higher scores demonstrate greater resilience. The entire original scale's internal consistency stands at α = .89, equivalent to the present study sample (α = .90).

Translation and Cultural Adaptation

"Translate-retranslate" protocols (Solano-Flores, Backhoff, & Contreras-Niño, 2009; Van de Vijver & Hambleton, 1996) were implemented to translate the original SISRI-24 in Greek. Independent forward translations were completed by two translators, AP and EZ, both native speakers of the target (Greek) and fluent in the source language (English). Following personal communications, the translators agreed upon the preliminary Greek version. For the cultural adaptation, three post-graduate students completed this version and were probed to report any semantic objections or confusions encountered. No significant changes in item meanings were detected. To verify the original meaning, this version was also back-translated into the source language by the third author/translator, NP, who was unaware of its original form.

The preliminary Greek versions, backward-translation, interviewee feedback, and original scale were then compared for discrepancies. Adjustments were made to produce a final consensus Greek version (presented in Appendix A; for scoring procedures, please refer to Appendix B).

Data Analysis for the Psychometric Evaluation

Analyses were conducted using *IBM SPSS Statistics 20* and *R Studio, v.3.3.2*. Sample size was checked for adequacy: The Kaiser-Meyer-Olkin measure was satisfactory (0.95), and Bartlett's test of sphericity (χ^2 = 18257.66, $p < .001$) was significant, indicating that the correlation matrix was not an identity matrix (i.e. the variables were related) and suitable for structure detection and factor analysis. Thus, after splitting our sample in half, we performed an EFA on n_1 (888), and a CFA on n_2 (889).

To assess model fit, chi-square (χ^2), comparative fit index (CFI), Tucker Lewis index (TLI), standardised root mean square residual (SRMR), and root mean square error of approximation (RMSEA) indices were analysed. Cutoff values for good fit were: χ^2 at $p > .05$, (those closest to zero indicated a better fit; Brown, 2015); CFI and TLI greater than .90 (Baumgartner & Homburg, 1996; Hu & Bentler, 1999); SRMR and RMSEA indices below .08 and .06 respectively (Brown, 2015; Hu & Bentler, 1999) were considered acceptable.

Reliability of the instrument was assessed using internal consistency (measured with Chronbach's α; values ≥.7 were considered acceptable, Nunnally & Bernstein, 1994). Correlation analyses were conducted on the entire sample, to investigate associations between gender, age, uppermost educational level, type of employment, religious denomination, (non)belief in a god/deity or higher power and the three subscales emerged from the factor analysis.

Results

Shapiro-Wilk tests were statistically significant for all 24 SISRI items ($p < .001$), suggesting a violation of the assumption of univariate normality. Similarly, significant Mardia's multivariate skewness and kurtosis tests ($p < .001$) violated multivariate normality.

Demographic information

Supplementary Table 1 provides a full listing of sample specificities, after quality control was performed. Participants have been classified into two groups, based on whether they declared a belief or nonbelief in God or higher power. To determine if there was a significant relationship between believers and nonbelievers, independent sample t-tests and chi-square analyses were calculated (shown in Supplementary Table 1).

The average global Greek SISRI-24 score was 55.7 (*SD* = 17.4). Items 21 and 24 produced the highest and lowest average responses (a complete display of descriptives for the translated SISRI-24 items is shown in Supplementary Table 2).

Establishing Construct Validity with Exploratory Factor Analysis (EFA)

Since the current study represents the first attempt to translate and establish the factor structure of the Greek version of the SISRI-24, an EFA was chosen as an extraction method, and performed on the first half of the sample to evaluate the instrument's construct validity. An oblique (nonorthogonal) rotation (direct oblimin technique) procedure was employed. After factor identification, we followed Judah and colleagues' (Judah, Grant, Mills, & Lechner, 2014) criteria for item retention, setting cutoff points at .40 for factor loadings and at .70 for eigenvalues. Our first attempt at an EFA model identified the following three factors: Factor 1 (CSE; items 4, 8, 12, 16, 24), which perfectly matched the original instrument; Factor 2 (PMP; items 7, 10, 11, 15, 19, 23); Factor 3 (CET; items 1, 2, 3, 13, 17, 21). Unlike the original instrument, factor weight was higher (in descending order) for CSE and PMP subscales (as opposed to CET in King, 2008). Initial loadings for items 5 and 9 (CET) and 14, 18, 20 and (TA) were below .40. Since these items did not load acceptably on any of the three factors extracted in this study, we removed them and reran the EFA model. Factors one, two and three retained the previously described structure. Item 2, which belonged in the original TA scale, remained in the newly developed scale (henceforth referred to by

the Greek transliteration KAPN), and was loaded on the CET factor, as was TA item 10 which loaded on the Greek CET subscale. The remaining low TA factor loadings may mean that the defined questions do not reflect a meaningful contribution in determining the SI construct for the Greek sample. Thus, they were trimmed from the extracted factor solution, leading to a final structure comprising 17 items (CSE: five items, PMP: six items, CET: six items) (Supplementary Table 3 demonstrates the complete factor loadings from the EFA model), in which all factor loadings exceeded .40 (Table 1) and no cross-loading items were present (Fig. 1, visually depicts the optimum number of components to retain).

EFA with three factors extraction revealed 50% of variance explained by this solution after rotation. CSE was the factor with the highest proportion of explained variance (19%), followed by PMP (17%). CET had the least proportion explained (14%). The model's fit statistics are presented in Table 2.

Confirming Construct Validity with Confirmatory Factor Analysis (CFA)

We performed a CFA to verify the three-component EFA model (Fig. 2) on the second dataset, which confirmed the structure that emerged as a good fit for the data so as to establish construct validity (the extent to which the instrument actually measures what the scale developer intended). For a summary of fit statistics, please refer to Table 3.

Reliability analysis

Internal consistencies (Cronbach, 1951) demonstrated an excellent internal structure for the entire KAPN, at α = .92, which was equivalent to its original form (King, 2008), suggesting that, after the scale had been reduced in size, the remaining 17 items legitimately tapped on the principle construct (SI) being operationalized. All subscales (CSE, α = .89; PMP, α = .80, CET, α = .81) displayed good reliability ($\geq$ .70 considered acceptable, $\geq$ .80 adequate per Kline, 2016). Former SISRI validation studies reported Cronbach alpha indexes: a = .84 to .86 (Portugal; Antunes, Silva, & Oliveira, 2018),

a =.78 to .91 (China; Chang & Siu, 2016), *a* = .84 to .96 (India; Anbugeetha, 2015). Taken in unison, the satisfactory results achieved endorse the use of KAPN as a reliable tool for the assessment of SI in the Greek population.

Comparisons to demographic factors

Comparisons between global and component KAPN scores according to demographic criteria are described in detail in Supplementary Table 4. Overall, SI significantly differed between age groups at the level of .001, but was unaffected by other sociodemographic factors. Average CSE and CET scores produced meaningful differences between males and females, different age groups, and religious denominations. PMP varied according to uppermost educational level, type of employment, belief in God, and religious denomination.

Convergent Validity

Convergent validity was assessed in the total sample (N = 1777). SISRI-24 item and factor loadings correlation patterns are presented in Fig. 3. Inter-subscale KAPN correlations (Table 4) were all moderately positive (CSE and PMP, *r* = .52; CSE and CET, *r* = .59; PMP and CET, *r* = .42; all *p* <.001). As expected, all three KAPN subscales yielded weak-to-moderate, yet reliable, correlations with MLQ subscale scores. Weak-to-moderate inverse correlations occurred between CSE and CET on both NRNSS subscales, as hypothesized, since higher scores represent weak institutional religiousness / individual spirituality on the NRNSS. Similarly, PMP and NS were inversely correlated, but no significant correlation was found to exist between PMP and NR. All three SISRI subscales established weak-to- moderate positive relationships with the CD-RISC subscales.

Discussion

This was the first attempt to translate, culturally adapt and assess the factorial structure and psychometric properties of SISRI-24 for Greek-speaking populations. So far, no other scale for assessing SI exists or has been validated for use in Greek. The original SISRI-24 factor structure was not reproduced in our Greek sample by means of EFA. Therefore, we revised and trimmed the instrument to an alternative three-factor model for construct validity. CFA results corroborated the superiority of the three-factor translated model, with the retention of 17 of the 24 SISRI items, which upheld the adapted instrument's (KAPN) structural validity at high levels, as demonstrated by the following fit indices: CFI=.92, TLI=.91, RMSEA=.06, SRMR=.06.

Internal consistency for KAPN (.92) and CES, PMP, and CET subscales (.89/.80/.81) was adequate and similar to that found in the original (King, 2008; King & Decicco, 2009) and international studies (Anbugeetha, 2015; Antunes et al., 2018; Chang & Siu, 2016). This suggests that the component KAPN items measure the same SI attributes and are related to the entire KAPN, as well its constituent dimensions.

The KAPN showed positive associations with measures of *presence of*, and *search for*, meaning, as well as all CD-RISC resilience components, demonstrating adequate convergent validity, and confirming the SI model, which suggests that the SI construct represents an active pursuit of meaning in one's life, with the purpose of adapting to and exhibiting resilience, in the face of every-day challenges. With the exception of PMP and NR, which were unrelated, all KAPN components yielded inverse correlations with NR and NS. Given that institutionalized religiosity offers a readily-available meaning framework for those who adhere to a particular religious denomination, it might be expected that –in the absence of such a framework- PMP would rely less on the religiosity, and instead draw upon other meaning systems (e.g. nature, philosophy, etc.). On the other hand, individuals high in SI (and, by extension, CET, PMP and CSE) are more likely to seek a deeper

awareness and understanding in any R/S system available, and use these spiritual repositories to establish a unique spiritual experience in dealing with everyday life.

The scientific value of our study lies in the fact that it promotes the utilization of KAPN as a prominent psychometric tool for the measurement of SI in a population with specific features of cultural diversity. We collected responses from an impressive cohort of 1777 individuals, encompassing a wide age range, from emerging to mature adulthood, leading to interesting provisional observations regarding demographic differences, which warrant future attention.

Nonetheless, convenience data sampling and the electronic collection of most responses, may pose some generalization limitations. In effect, it may have prohibited participation to the less technological-savvy age cohorts.

Conclusion and Future Directions

Overall, our results corroborate the use of KAPN for assessing SI in Greek speaking populations. Further studies to provide more data on the factorial, concurrent, discriminant, convergent, and criterion validity, as well as test-retest reliability of KAPN are recommended, to ascertain equivalence. It is also recommended to conduct comparative studies among individuals with different religious and cultural contexts (Abu-Raiya, 2017), different age groups so as to study the developmental progression of SI, as well as with different demographic populations (i.e. clinical versus non-clinical) to obtain more insight of its utility.

Furthermore, the present study expands our conceptual understanding of SI, by turning this mental capacity operative for Greek-speaking populations. This development carries vast world-wide implications with regards to specific (and related) research domains such as individual differences and personality traits (MacDonald, 2000), multiple intelligence, positive psychology, spirituality, religion, cultural diversity, mental health, and leadership. Consequently, the translated instrument

lends itself to future empirical studies pertaining to cross-cultural, comparative analyses, critical reviews, and could better inform meta-analytic results. The idea that measuring SI may be a stepping stone towards actually enhancing SI, as suggested by Anbugeetha (2015), renders KAPN a promising precursor for the investigation and development of human potential and the enhancement of mental health benefits associated with SI at a national and global level.

To conclude, KAPN, the Greek version of SISRI-24, presents satisfactory psychometric properties to suggest its use as a reliable and valid psychometric tool for the measurement of SI in the Greek population.

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Appendix A

KAPN (SISRI-24, Greek version)

ΚΛΙΜΑΚΑ ΑΥΤΟΑΝΑΦΟΡΑΣ ΠΝΕΥΜΑΤΙΚΗΣ ΝΟΗΜΟΣΥΝΗΣ

Οι ακόλουθες δηλώσεις σχεδιάστηκαν με σκοπό να μετρήσουν διάφορες συμπεριφορές, διεργασίες σκέψης, και διανοητικά χαρακτηριστικά. Διάβασε κάθε δήλωση προσεχτικά και επίλεξε τη **μία** από τις πέντε διαθέσιμες απαντήσεις που σε εκφράζει καλύτερα, κυκλώνοντας τον αντίστοιχο αριθμό. Προσπάθησε να απαντήσεις με ειλικρίνεια, και να επιλέξεις τις αποκρίσεις σου με βάση αυτό που είσαι και όχι αυτό που θα ήθελες να είσαι. Οι πέντε διαθέσιμες αποκρίσεις είναι:

0 – Δε με εκφράζει | 1 – Δε με εκφράζει πολύ | 2 – Με εκφράζει κάπως | 3 – Με εκφράζει πολύ | 4 – Με εκφράζει απόλυτα

Για κάθε δήλωση, κύκλωσε τη **μία** απόκριση που σε περιγράφει με μεγαλύτερη ακρίβεια.

1.	**Αναρωτιέμαι συχνά για τη φύση της πραγματικότητας.**	**0**	**1**	**2**	**3**	**4**
2.	Αναγνωρίζω πτυχές του εαυτού μου που είναι βαθύτερες από το φυσικό μου σώμα.	0	1	2	3	4
3.	Έχω περάσει χρόνο αναρωτώμενος/η τον σκοπό ή την αιτία της ύπαρξής μου.	0	1	2	3	4
4.	Είμαι ικανός/-η να εισέλθω σε ανώτερες καταστάσεις συνειδητότητας ή επίγνωσης.	0	1	2	3	4
5.	Η ικανότητά μου να βρίσκω νόημα και σκοπό στη ζωή με βοηθά να προσαρμόζομαι σε αγχώδεις καταστάσεις.	0	1	2	3	4
6.	Μπορώ να ελέγχω πότε εισέρχομαι σε ανώτερες καταστάσεις συνειδητότητας ή επίγνωσης.	0	1	2	3	4
7.	Έχω επίγνωση της βαθύτερης σχέσης ανάμεσα σε εμένα και άλλους ανθρώπους.	0	1	2	3	4
8.	Είμαι ικανός/η να προσδιορίσω σκοπό ή νόημα στη ζωή μου.	0	1	2	3	4
9.	Είμαι ικανός/η να περιηγούμαι ελεύθερα ανάμεσα σε επίπεδα συνειδητότητας ή επίγνωσης.	0	1	2	3	4
10.	Συχνά αναρωτιέμαι για το νόημα των συμβάντων της ζωής μου.	0	1	2	3	4
11.	Ακόμα κι όταν βιώνω μία αποτυχία, μπορώ να βρω νόημα σε αυτήν.	0	1	2	3	4
12.	Συχνά βλέπω τα ζητήματα και τις επιλογές πιο ξεκάθαρα όταν βρίσκομαι σε ανώτερες καταστάσεις συνειδητότητας/επίγνωσης.	0	1	2	3	4
13.	Έχω αναλογιστεί αρκετές φορές τη σχέση ανάμεσα στα ανθρώπινα όντα και το υπόλοιπο σύμπαν.	0	1	2	3	4
14.	Είμαι ικανός/η να παίρνω αποφάσεις με βάση τον σκοπό της ζωής μου.	0	1	2	3	4
15.	Έχω αναλογιστεί βαθιά εάν υπάρχει ή όχι κάποια ανώτερη πηγή δύναμης ή εξουσίας (π.χ. Θεός, θεότητα, ιερή ύπαρξη, ανώτερη ενέργεια, κτλ.).	0	1	2	3	4
16.	Μπορώ να βρίσκω νόημα και σκοπό στα καθημερινά μου βιώματα.	0	1	2	3	4
17.	Έχω αναπτύξει τις δικές μου τεχνικές για να εισέρχομαι σε ανώτερες καταστάσεις συνειδητότητας ή επίγνωσης.	0	1	2	3	4

Appendix B

Scoring Procedures for KAPN (SISRI-24, Greek version)

Διαδικασία Βαθμολόγησης
Κλίμακας Αυτοαναφοράς Πνευματικής Νοημοσύνης (ΚΑΠΝ)

Οι 17 δηλώσεις/προτάσεις που απαρτίζουν την ΚΑΠΝ παρουσιάζονται μαζί ως σύνολο και κάθε απάντηση γίνεται σε κλίμακα τύπου Likert 5 διαβαθμίσεων (0 = Δε με εκφράζει, 1 = Δε με εκφράζει πολύ, 2 = Με εκφράζει κάπως, 3 = Με εκφράζει πολύ, 4 = Με εκφράζει απόλυτα).

Για κάθε άτομο υπολογίζονται 4 βαθμοί:

A. Συνολικός Βαθμός Πνευματικής Νοημοσύνης:

Προκύπτει από την άθροιση των βαθμών όλων των δηλώσεων-προτάσεων της κλίμακας [17 στοιχεία. Εύρος *0 – 68*]

B. Παράγοντες / Υποκλίμακες (3):

1. **Διεύρυνση Κατάστασης Συνειδητότητας [Conscious State Expansion (CSE)]:**
   Άθροισε τα στοιχεία **4, 6, 9, 12**, και **17** [***5*** *στοιχεία στο σύνολο˙ εύρος 0 – 20*]
2. **Παραγωγή Προσωπικού Νοήματος [Personal Meaning Production (PMP)]:**
   Άθροισε τα στοιχεία **5, 7, 8, 11, 14**, και **16** [***6*** *στοιχεία στο σύνολο˙ εύρος 0 – 24*]
3. **Κριτική Υπαρξιακή Σκέψη [Critical Existential Thinking (CET)]:**
   Άθροισε τα στοιχεία **1, 2, 3, 10, 13** και **15** [***6*** *στοιχεία στο σύνολο˙ εύρος 0 – 24*]

**Οι υψηλότερες βαθμολογίες αντιστοιχούν σε υψηλότερα επίπεδα πνευματικής νοημοσύνης και/ ή κάθε επιμέρους ικανότητα.*

Table 1.

Factor structure and saturation values of items in factors for KAPN

Item	Factor 1	Factor 2	Factor 3
SISRI.*08*– I can control when I enter higher states of consciousness or awareness.	**.88**		
SISRI.*04*– I am able to enter higher states of consciousness or awareness.	**.73**		
SISRI.*16*– I often see issues and choices more clearly while in higher states of consciousness/awareness.	**.72**		
SISRI.*12*– I am able to move freely between levels of consciousness or awareness.	**.71**		
SISRI.*24*– I have developed my own techniques for entering higher states of consciousness or awareness.	**.69**		
SISRI.*11*– I am able to define a purpose or reason for my life.		**.77**	
SISRI.*19*– I am able to make decisions according to my purpose in life.		**.72**	
SISRI.*23*– I am able to find meaning and purpose in my everyday experiences.		**.72**	
SISRI.*07*– My ability to find meaning and purpose in life helps me adapt to stressful situations.		**.67**	
SISRI.*15*– When I experience a failure, I am still able to find meaning in it.		**.52**	
SISRI.*10*– I am aware of a deeper connection between myself and other people.		**.46**	
SISRI.*03*– I have spent time contemplating the purpose or reason for my existence.			**.82**
SISRI.*01*– I have often questioned or pondered the nature of reality.			**.66**
SISRI.*17*– I have often contemplated the relationship between human beings and the rest of the universe.			**.60**
SISRI.*13*– I frequently contemplate the meaning of events in my life.			**.53**
SISRI.*21*– I have deeply contemplated whether or not there is some greater power or force (e.g., god, goddess, divine being, higher energy, etc.).			**.51**
SISRI.*02*– I recognize aspects of myself that are deeper than my physical body.			**.41**

KAPN: SISRI, Greek version
Extraction method: factor analysis; rotation method: direct oblimin.
Note. Bold values indicate the items retained (loadings above the .40 cutoff) in each factor.

Table 2.

Summary of fit indices from the exploratory factor analysis model (with three factors) of the Greek SISRI (KAPN) on 888 subjects.

	Estimate	Reference
χ^2	9459.75	-
Comparative fit index (CFI)	.96	≥ .90
Tucker Lewis index (TLI)	.94	≥ .90
Root mean square error of approximation (RMSEA)	.05	≤ .06
Standardised root mean square residual (SRMR)	.03	≤ .08
α (CSE / PMP / CET)	.88/.81/.84	≥ .70

a: Cronbach's alpha; CSE: critical state expansion; PMP: personal meaning production; CET: critical existential thinking.

Table 3.

Summary of fit indices from the confirmatory factor analysis model (with three factors) of the Greek SISRI (KAPN) on 889 subjects.

	Estimate	Reference
χ^2	616.65	-
Comparative fit index (CFI)	.92	≥ .90
Tucker Lewis index (TLI)	.91	≥ .90
Root mean square error of approximation (RMSEA)	.06	≤ .06
Standardised root mean square residual (SRMR)	.06	≤ .08
α (CSE / PMP / CET)	.89/.80/.81	≥ .70

a: Cronbach's alpha; CSE: critical state expansion; PMP: personal meaning production; CET: critical existential thinking.

Table 4.

Inter-subscale correlations between KAPN total and measures of convergent validity

	KAPN	**CSE**	**PMP**	**CET**
KAPN (*N* = 1777)				
CSE	.86 ***	—	.52 ***	.59 ***
PMP	.80 ***	.52 ***	—	.42 ***
CET	.81 ***	.59 ***	.42 ***	—
NRNSS				
Non-religious	-.07 **	-.09 ***	.01	-.09 ***
Non-spiritual	-.46 ***	-.40 ***	-43 ***	-.29 ***
MLQ				
Presence	.43 ***	.33 ***	.17 ***	.58 ***
Search	.40 ***	.28 ***	.37 ***	.34 ***
CD-RISC				
Personal competence High standards Tenacity	.34 ***	.27 ***	.11 ***	.47 ***
Trust in one's instincts Tolerance of negative affect Strengthening effects of stress	.43 ***	.36 ***	.19 ***	.51 ***
Positive acceptance of change Secure relationships	.29 ***	.21 ***	.10 ***	.41 **
Control	.41 ***	.33 ***	.15 ***	.55 ***
Spiritual influences	.25 ***	.22 ***	.17 ***	.23 ***

Note. All scores are expressed as *r* (*p*-value); $^{*}p < .05$ $^{**}p < .01$ $^{***}p < .001$
Labels: Total KAPN = entire KAPN score, CSE: conscious state expansion, PMP: personal meaning production, CET: critical existential thinking.

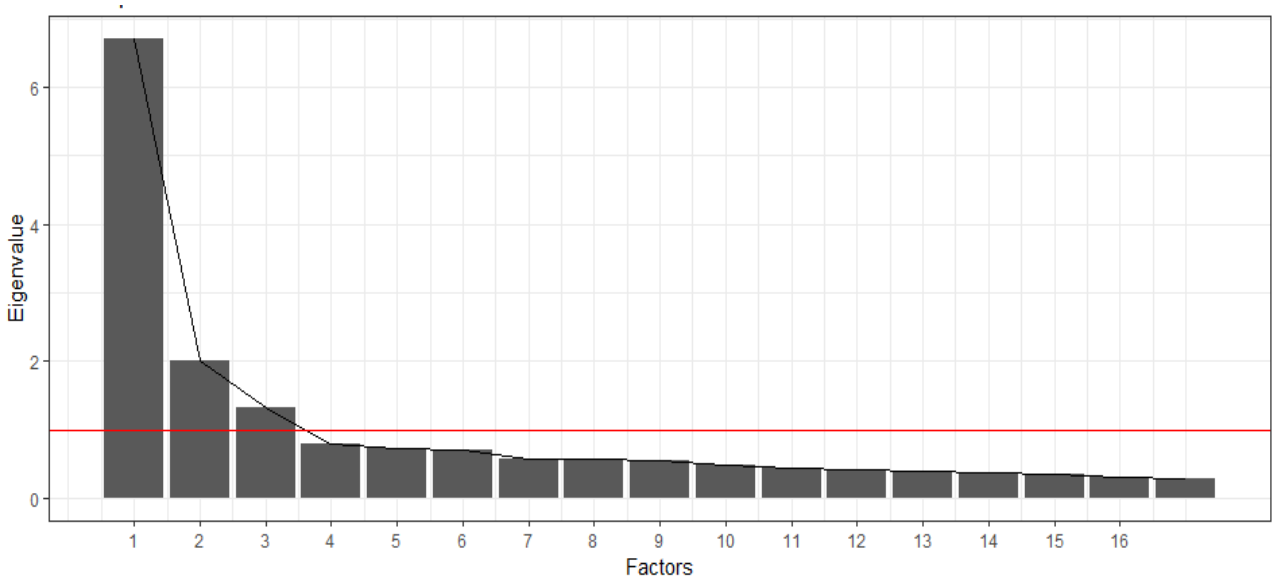

Figure 1. Scree plot illustrating the results from the final EFA model for the Greek SISRI (KAPN). Factor 1 denotes *conscious state expansion*, Factor 2 *personal meaning production*, and Factor 3 *critical existential thinking*.

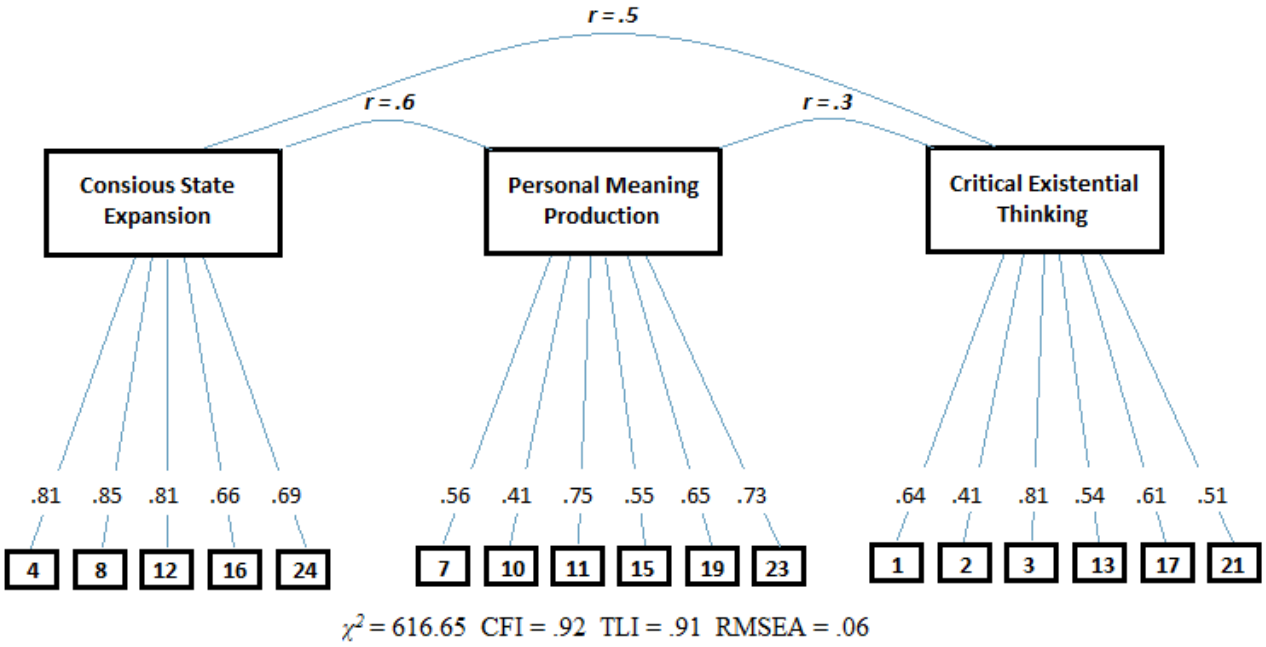

Figure 2. Confirmatory factor analysis. The figure shows the factor loadings for the indicators of the constructs of KAPN subscales. Numbers within the outlined boxes represent item numbers. Numbers outside the outlined boxes represent the factor loadings; *r* denotes correlations between the subscales.

Figure 3. Correlation matrix for KAPN items and their factor loadings in the CFA model

Supplementary Table 1

Descriptive and inferential statistics for demographic information arranged by self-declared belief

Demographic Information									
	Total* N = 1777		Believers n = 1005		Nonbelievers n = 378		χ^2	*p*	*Cramer's V*
	N	%	n	%	n	%			
Gender**							35.9	<.001	.10
Male	441	24.8	204	136	136	36.0			
Female	1335	75.1	801	79.7	241	63.8			
Age (years)**							8.5	.04	.05
18-25	625	35.2	331	32.9	146	38.62			
26-39	576	32.4	313	31.1	131	34.65			
40-59	440	24.8	270	26.8	82	21.7			
> 60	58	3.3	41	4.1	9	2.4			
Educational level**							3.1	.38	.04
High school	223	12.5	129	12.8	41	10.9			
Bachelor	1048	59.0	577	57.4	227	60.1			
Masters	431	24.3	260	25.9	90	23.8			
Doctorate	71	4.0	36	3.6	19	5.1			
Type of employment**							5.3	.15	.05
Full-time	787	44.3	446	44.4	175	46.3			
Part-time	301	17.0	153	15.2	67	17.7			
Unemployed	597	33.6	343	34.1	124	32.8			
Retired	86	4.8	59	5.9	12	3.2			
Religion**							789.6	<.001	.40
Christianity	1279	72.0	918	91.3	89	23.5			
Unaffiliated	363	20.4	25	2.5	268	70.9			
Spiritual	59	3.3	35	3.5	8	2.1			
Other	55	3.1	20	2.0	10	2.6			
Buddhism	10	0.6	4	0.4	0	0			
Islam	3	0.2	3	0.3	0	0			
Judaism	1	0.1	0	0	1	0.3			
Measures									
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*F*	*p*	
SISRI	55.7	17.4	56.9	17.4	51.8	18.6	22.96	<.001	
NRNSS	49.3	13.6	41.6	9.9	64.1	11.1	1311	<.001	
MLQ	49.5	10.0	50.8	9.7	47.0	11.4	37.66	<.001	
CD-RISC	92.5	13.7	94.3	13.5	89.5	13.8	33.39	<.001	

**Entire sample composition:*
Believers = 1005; Nonbelievers = 378; Uncertain = 391 and Undisclosed = 3 (not shown)

***Missing values: Gender: 1 nonbeliever; Age: 50 believers/ 10 nonbelievers; Educational level: 3 believers/ 1 nonbeliever; Type of employment: 4 believers; Religion: 2 nonbelievers*

Supplementary Table 2

Descriptive statistics for SISRI-24 items and total obtained using the Greek translation (prior to EFA)

	Mean	Std. Dev.	Min.	Max.
SISRI.*01*	2.4	1.2	0	4
SISRI.*02*	2.6	1.3	0	4
SISRI.*03*	2.6	1.3	0	4
SISRI.*04*	2.1	1.3	0	4
SISRI.*05*	1.7	1.3	0	4
SISRI.*06**	2.7	1.3	0	4
SISRI.*07*	2.6	1.2	0	4
SISRI.08	1.7	1.2	0	4
SISRI.*09*	2.1	1.3	0	4
SISRI.*10*	2.7	1.1	0	4
SISRI.*11*	2.5	1.1	0	4
SISRI.*12*	1.7	1.2	0	4
SISRI.*13*	2.7	1.2	0	4
SISRI.*14*	2.1	1.3	0	4
SISRI.*15*	2.6	1.1	0	4
SISRI.*16*	2.1	1.3	0	4
SISRI.*17*	2.3	1.3	0	4
SISRI.*18*	2.2	1.2	0	4
SISRI.*19*	2.5	1.1	0	4
SISRI.*20*	2.6	1.3	0	4
SISRI.*21*	3.0	1.2	0	4
SISRI.*22*	2.2	1.3	0	4
SISRI.*23*	2.7	1.1	0	4
SISRI.*24*	1.6	1.3	0	4
Total SI	55.7	17.4	0	96

**Reverse coded item.*

Supplementary Table 3

Factor structure and saturation values of items in factors for KAPN

Item	Factor 1	Factor 2	Factor 3
SISRI*08* – I can control when I enter higher states of consciousness or awareness.	**.88**	-.02	-.08
SISRI*04* – I am able to enter higher states of consciousness or awareness.	**.73**	-.07	.16
SISRI*16* – I often see issues and choices more clearly while in higher states of consciousness/awareness.	**.72**	0	.11
SISRI*12* – I am able to move freely between levels of consciousness or awareness.	**.71**	.11	-.05
SISRI*24* – I have developed my own techniques for entering higher states of consciousness or awareness.	**.69**	.14	-.05
SISRI*11* – I am able to define a purpose or reason for my life.	-.02	**.77**	-.01
SISRI*19* – I am able to make decisions according to my purpose in life.	-.02	**.72**	-.04
SISRI*23* – I am able to find meaning and purpose in my everyday experiences.	.06	**.72**	.03
SISRI*07* – My ability to find meaning and purpose in life helps me adapt to stressful situations.	-.02	**.67**	.03
SISRI*15* – When I experience a failure, I am still able to find meaning in it.	.09	**.52**	.09
SISRI*10* – I am aware of a deeper connection between myself and other people.	.02	**.46**	.01
SISRI*03* – I have spent time contemplating the purpose or reason for my existence.	-.03	-.06	**.82**
SISRI*01* – I have often questioned or pondered the nature of reality.	.01	0	**.66**
SISRI*17* – I have often contemplated the relationship between human beings and the rest of the universe.	.10	.05	**.60**
SISRI*13* – I frequently contemplate the meaning of events in my life.	-.01	.17	**.53**
SISRI*21* – I have deeply contemplated whether or not there is some greater power or force (e.g., god, goddess, divine being, higher energy, etc.).	-.02	.15	**.51**
SISRI*02* – I recognize aspects of myself that are deeper than my physical body.	.33	.04	**.41**

Note. Extraction method: factor analysis; Rotation method: direct oblimin.
Bold values indicate the items retained in each factor.

Supplementary Table 4

Associations of KAPN total and subscales on demographic criteria.

	KAPN		CSE		PMP		CET	
	χ^2	*p*	χ^2	*p*	χ^2	*P*	χ^2	*p*
Gender	56.73	.81	40.35 ***	<.001	31.11	.15	41.63 **	.01
Age groups	42.42 ***	<.001	93.27 ***	<.001	86.13	.12	100.46 *	.02
Belief in God	137.22	.40	73.00 ***	<.001	64.49 *	.05	69.84 *	.02
Religious denomination	363.90	.91	182.17 ***	<.001	201.10 ***	<.001	109.54	.99
Educational level	215.05	.24	48.97	.89	108.47 ***	<.001	72.59	.46
Type of employment	214.03	.25	62.24	.40	102.72 **	.01	89.03	.08

Note. **Gender:** Females/ Males; **Age groups:** 18-25/ 26-39/ 40-59/ >60; **Belief in God:** Yes/ No/ Uncertain; **Religious denomination:** No religion/ Buddhism/ Christianity/ Islam/ Judaism/ Spiritual/ Other; **Educational level:** High school/ Bachelor/ Masters/ PhD; **Type of employment:** Full time/ Part time/ Unemployed/ Retired.
$^{*}p < .05$ $^{**}p < .01$ $^{***}p < .001$
Labels: CSE: conscious state expansion; PMP: personal meaning production; CET: critical existential thinking.