



CROSS-CULTURAL ADAPTATION AND RELIABILITY EVALUATION OF THE LITHUANIAN VERSION OF THE KEYS QUESTIONNAIRE

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ABSTRACT

The aim of this study is the KEYS questionnaire cross-cultural adaptation into the Lithuanian language. This study was designed to translate and perform cultural adaptation as well as test the reliability of the Lithuanian version of the KEYS questionnaire. Guidelines for the questionnaire translation and adaptation procedure according to international recommendations based on scientific literature were followed in order to establish the cultural equivalence to the original English version of the KEYS questionnaire. In the cross-cultural adaptation stage, due to the Lithuanian cultural context, several discrepancies between the semantic and conceptual equivalence of the items were modified. In total, 155 respondents participated in the pilot study of the Lithuanian KEYS version. As to reliability of the Lithuanian KEYS version, psychometric properties were tested, Cronbach's alpha coefficient was used to assess the internal consistency. Mostly all scales and items demonstrated good internal consistency. The Lithuanian KEYS version was a well-accepted, reliable tool for evaluating and assessing individual work environment perceptions that influence the creativity of organizations among the Lithuanian speaking population. We conclude that the Lithuanian version of the KEYS questionnaire was successfully translated and adapted for application to Lithuanian-speaking respondents and it is ready for the validation study. Such a research is the first in the Baltic region.



Keywords: creativity; KEYS questionnaire; cross-cultural adaptation and validation; Lithuania

1. INTRODUCTION

It is stated that creativity is the key factor determining organizational survival and success. Researchers analysing organisational creativity accentuate that the phenomenon organizational creativity is affected by numerous environmental factors and one of them is the organizational climate (West & Sacramento, 2012). The measurement of creative and innovative environments may be useful in order to identify to what degree the organization's work environment is favourable in this respect (Mathisen & Einarsen, 2004).

It is clear that there is a need for instruments to assess the extent to which a particular work environment promotes organisational creativity and innovation. Moreover, such research instrument could be the means that helps researchers investigating the influence of the context on organisational creativity to develop further research and theory as well as assists practitioners to evaluate the extent to which the organizational climate promotes employees' creativity in their organisation (Amabile, 1995; Amabile et al., 1995, 1996; Amabile, 2012).

Scientific literature presents well-developed instruments intended for measurement of different aspects of work environment related to innovation and creativity (Amabile et al., 1996; Anderson & West, 1994, 1996, 1998; Epstein, Santo & Guillemin, 2015).

However, few of them are standardized and validated by well-documented evidence, especially the ones measuring the dimensions of the work settings with regard to innovation and creativity. As stated by Mathisen and Einarsen (2004), who studied the research instruments intended for the assessment of the organisational atmosphere in terms of innovation and creativity, appropriate research instruments to assess the said work settings-related determinants have been developed, West's TCI (Anderson & West, 1994, 1996) and Amabile's KEYS (Amabile et al., 1996) among them.

Mathisen and Einarsen (2004) conclude that the KEYS questionnaire and the TCI questionnaire are of sufficient scientific quality and have high functional value, although can still be improved; i.e., these questionnaires were used in research by researchers from many countries, and their research results were published in high quality journals (Agrell & Gustafson, 1994; Kivimäki & Elovainio, 1999; Ensor, Cottam & Band, 2001; Mohamed, 2005; Bosch et al., 2008; Ouwens et al., 2008; Brown et al., 2015; Agreli, Peduzzi & Bailey, 2017; Ramos, Figueiredo & Pereira-Guizzo, 2018; Primus & Jiang, 2019; Lee & Chen, 2020; etc.).



Mathisen and Einarsen (2004) investigated research instruments published in the peer-reviewed literature, exploring their psychometric properties. They found that the KEYS manual was developed with norms that were based on 78 groups from 50 different organizations (N=12,525) and represented a wide range of industries. The KEYS scales are characterised by acceptable factor structures, internal consistencies, high test-retest reliabilities, tested construct validity, preliminary convergent and discriminant validity (Amabile et al., 1996).

Besides, having conducted the meta-analysis of 42 studies on the relationships between the aspects of the climate in the organisation, Hunter et al. (2007) also pointed out KEYS and TCI, bearing in mind the findings of contrasting research grounded on standardized climate inventories (e.g., KEYS, TCI) and on locally developed ones. According to Hunter et al. (2007), studies employing standardized research instruments usually make a far bigger impact, compared to locally developed instruments; therefore, the organisational climate should be studied using instruments that are well-designed and thoroughly researched.

The growth in the number of multicultural research, international projects and the like has determined a rapid increase in the necessity for adaptation of research instruments in another than the original language. Based on the scientific literature, it is proposed that researchers should adapt the questionnaire and supplement it with its validity evidence instead of developing a new questionnaire.

Epstein et al. (2015) states that adaptation of the research instrument takes less time and may be equivalent to the original. Beaton et al. (2000) note that cross-cultural adaptation of the questionnaire not only can save considerable time and effort but also is the best way to get the equivalent metric and allows data collection efforts to be the same in cross-national studies (Watson, 2014). The use of established measures further enables to compare findings in different cultures and conduct international studies (Van Widenfelt et al., 2005).

Adapted existing English language questionnaires allow to compare different populations and exchange information, overcoming cultural and linguistic barriers (Maher, Latimer & Costa, 2007). Thus, adaptation of assessment instruments enables to compare research findings in different cultures, facilitating information sharing among researchers in different countries and decreasing expenses and time spent for research (Arafat et al., 2016).

2. OVERVIEW

Scientific literature emphasizes that, in most cases, instruments can be adapted to another language or culture and used successfully, in accordance with methodological rules.



The term ‘cross-cultural adaptation’ encompasses both linguistic (related to translation) and cultural adaptation matters when the questionnaire is prepared to be used in another environment (Beaton et al., 2000).

Cross-cultural adaptation requires to use a unique method so that the original and the adapted versions of the questionnaire are equivalent (Arafat et al., 2016). Though there is no consensus in the scientific literature that summarizes how the instrument should be adapted for use in a new cultural context, the literature presents various models of instrument translation and cross-cultural adaptation (Guillemin et al., 1993; Beaton et al., 2000; Van Widenfelt et al., 2005; Maher et al., 2007; Gjersing et al., 2010).

Guidelines described by Beaton, et al. (2000) is one of the mostly used and practiced guideline (including these stages: initial translation; combining of translations; re-translation into the original language; professionals’ group; trying-out of the pre-final questionnaire version), which was chosen for the particular research.

With the permission of the Centre for Creative Leadership, the process of adapting the KEYS questionnaire to Lithuanian culture was started. The Lithuanian version of the KEYS questionnaire was prepared according to standard strict requirements of the questionnaire translation and adaptation procedure, following international recommendations. Based on scientific literature (Guillemin et al., 1993; Beaton et al., 2000), the process of adapting the questionnaire consisted of six stages: (1) translating the questionnaire from the original – English – language to Lithuanian, (2) synthesis of translated versions, (3) back translation, (4) experts’ evaluation, (5) testing the questionnaire with the target population, and (6) testing, calculating psychometric indicators. The short presentation of the KEYS questionnaire and the description of the whole process of translating and adapting the KEYS questionnaire in Lithuania are given below.

3. MATERIAL, METHODS AND PROCEDURE

3.1. KEYS: Assessing the Climate for Creativity

The KEYS work environment inventory (Amabile et al., 1996) is a validated instrument that has been used most widely in the domain of organizational creativity research. As noted earlier, the KEYS appears to have acceptable scientific quality as well as high utilitarian value (Mathisen & Einarsen, 2004), which is why the instrument was chosen for cross-cultural adaptation in the Lithuanian language.



KEYS is aimed at measuring individual work environment perceptions that influence the creativity of organizations. This instrument is a quantitative assessment tool and it is a revised version of the organisational settings questionnaire developed by Amabile and Gryskiewicz (1989). The KEYS research instrument and the fundamental conceptual model were created seeking to obtain a well-founded method for adequate assessment of various dimensions of work environment before theoretical and empirical work was proposed. Besides, the conceptual model of Amabile et al. (1996) reflects other significant theoretical and research evidence, such as the organizational creativity model of Woodman et al. (1993) and empirical findings of Scott and Bruce (1994).

The KEYS environment scales are grounded on the component-based model of organisational creativity and innovation and offer five conceptual groups (promotion of creativity, independence or free will, supplies, pressures and organisational barriers to creativity). The description of these scales and their corresponding dimensions are presented in Figure 1.

The research instrument includes 78 statements grouped into eight scales reflecting various aspects of the organisational environment and two scales representing employee creativity and work efficiency. Six scales related to the organisational environment name stimuli of creativity, which, according to the authors, positively influence work outcomes. These are independence, positive challenge, active support of supervisors, team support, organizational promotion and adequate resources. The two remaining scales of the organisational environment generalise what hinders creativity and, according to the authors, has a negative effect on creativity at work, namely, organisational hindrances and heavy workload.

The KEYS instrument was designed as a measure for the development of research and theory, especially in the field of the influence of the work environment on employees' creativity in organisations. Mathisen and Einarsen (2004) state that the KEYS instrument is of acceptable quality and is widely described in peer-reviewed journals. The KEYS instrument includes a manual with norms based on 78 groups from 50 different organizations (N=12,525), representing a wide range of industries, and instructions for use (Amabile et al., 1999). The KEYS scales are acceptable with regard to factor structures, internal consistencies, high test-retest reliabilities, tested construct validity, preliminary convergent and discriminant validity (Amabile et al., 1996).



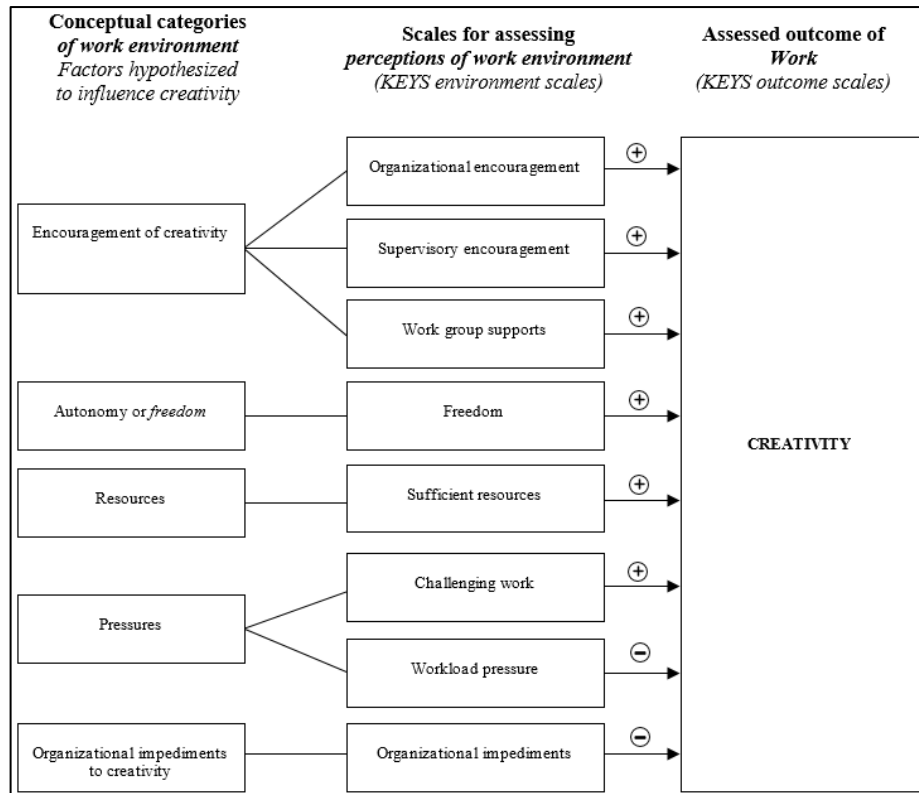


Figure 1: The KEYS environment scales and their dimensions

Source: Amabile et al. (1996)

The process of adapting and validating the KEYS instrument in Lithuania is given below. The cross-cultural adaptation of the KEYS questionnaire into the Lithuanian language was based on the works of the following authors: Dihle, Helseth and Christophersen (2008), Heeren et al. (2011), Alqarni et al. (2018) and others.

3.2. Translation and Cultural Adaptation

Translation, synthesis and back translation. Firstly, translations of the questionnaire into the Lithuanian language were performed. Two independent professional translators, whose first languages were Lithuanian, were selected for this stage. They presented two original versions of the Lithuanian KEYS questionnaire. Based on Gjersing, Caplehorn and Clausen (2010), two versions of the translation were reviewed in a joint meeting attended by the third independent translator, who had knowledge on the methodology of the questionnaire.

The review constituted synthesising of two versions, forming one integrated variant. When translators reconciled differences in translations, the Lithuanian version of the KEYS questionnaire was completed. Then, a native speaker of English translated this reconciled version back into the original language. Three independent translators and the native speaker

of English each submitted their written reports on every version of the translation, giving their remarks and substantiation why one or another variant should or should not be used.

All the reports were submitted to the experts' committee.

The experts' committee. The Lithuanian version of the KEYS questionnaire was submitted for review to the experts' committee. The experts' committee consisted of four experts, two of whom were scientists and two practitioners. The experts were selected purposefully according to their field of expertise, scientific expertise and competencies. All four experts fluent in both written English and written Lithuanian. The experts' committee was formed for external (face and content) validity in order to assess all variants of translations and to examine the report comments.

The experts were asked to check the conformity of the translated version with the original version and the precision of the Lithuanian items. The aim was to clarify items, relevance to linguistic and cultural aspects (style, formatting and comprehensibility, consistency, clarity and suitability of the language used in Lithuanian culture). The experts identified the words or items that raised doubts or uncertainties, established their causes and gave proposals for reformulating vague terms. Besides, the experts also checked the accuracy of the Lithuanian KEYS against the original English KEYS. Experts also checked the accuracy of the Lithuanian KEYS against the original English KEYS.

An evaluation form has been developed and presented to facilitate the procedure for the experts to evaluate each item according to the Likert scale from 1 to 4. The experts independently evaluated suitability of each item of the questionnaire. Four evaluation forms of questionnaire validation were received. Then, each expert was interviewed individually. According to Lynn's (1986) methodology, the content validity index (CVI) was calculated for questionnaire scales and single items.

Corrections of the synthesis of translations after the evaluation performed by the experts' committee. Upon the analysis of initial translations, the experts' committee submitted recommendations for corrections. During the discussion, the places of the questionnaire that were the most distant from the original were noted. After this stage, incorrect or unclear stylistics of the statements was identified, incorrectly translated terms and some grammatical errors were found.

Moreover, several discrepancies between the semantic and conceptual equivalence of the questionnaire were highlighted. The evaluation and review were followed by a discussion



in the committee on all details until the consensus was reached on all discrepancies; the pre-final version of the Lithuanian KEYS questionnaire was formulated.

Testing with the sample of the target population. The pre-final version of the Lithuanian KEYS questionnaire was tested with the sample of 7 practitioners of different ages, working in different business fields, who are native Lithuanian speakers. The aim was to ensure that all content is understood and to assess the general comprehension of items. The problems encountered were related to phrasing, intelligibility and suitability. Some statements in the synthesized and reconciled version were changed to improve cultural awareness. In this stage, the focus was on the assessment of usability of the Lithuanian KEYS questionnaire version.

After completing all stages of cross-cultural adaptation, the final Lithuanian version of the KEYS questionnaire was prepared for the pilot study.

3.3. Statistical analysis and psychometric properties

Procedure and data collection. In accordance with published guidelines (Guillemin et al., 1993; Beaton et al., 2000), the final Lithuanian version of the KEYS questionnaire was submitted to the pilot study after translation and cultural adaptation for use with Lithuanian speaking populations. The Lithuanian version of the KEYS questionnaire was placed on an online survey platform and a pilot study was conducted. The aim of the pilot study was initial evaluation of reliability of the Lithuanian KEYS version. The survey was conducted by completing a questionnaire on the Internet using the public survey platform 'www.apklausk.lt'. The pilot study was conducted in January-March, 2018, and the data were processed using the SPSS software.

Participants. The study was conducted with 155 respondents who had Lithuanian citizenship and worked in various Lithuanian organizations in both, i.e. public and private sectors, mainly full-time employees. The sample (N=155) was selected using convenience sampling, when the working situation (employment) at the time of conducting the study was an important selection criterion.

Psychometric assessments and statistical analysis. The reliability of the questionnaire was evaluated using the following psychometric parameters: descriptive statistics was used to establish the demographic and other characteristics of the participants assessed and Cronbach's alpha, to assess internal consistency. The psychometric characteristics of questionnaire are presented in detail below.

4. RESULTS



Participants' characteristics. In total, 155 respondents (40 (25.8 %) men and 115 (74.2 %) women) participated in the validation of the Lithuanian KEYS version. The participants' demographic and other characteristics are summarized in Table 1. The majority of the participants were from large organizations with more than 250 employees (57 (36.8 %)); others, from medium organizations with less than 250 employees (38 (24.5 %)); from small organizations with less than 50 employees (39 (25.2 %)); and from very small organizations with less than 10 employees (21 (13.6 %)). Participants were from the public sector (61 (39.3%)) and the private sector (94 (60.7 %)) (these data are not shown).

Table 1: Participants' demographic and other characteristics

Characteristics	Total (N=155)
Women, n (%)	115 (74.2)
Men, n (%)	40 (25.8)
Age, n (%)	
From 18 to 25 years	34 (21.9)
From 26 to 30 years	40 (25.8)
From 31 to 40 years	54 (34.8)
From 41 to 50 years	12 (7.7)
Over 51 years	15 (9.7)
Total work experience, n (%)	
From 0 to 1 years	5 (3.2)
From 1 to 5 years	45 (29.0)
From 6 to 10 years	33 (21.3)
From 11 to 15 years	39 (25.2)
From 16 to 20 years	8 (5.2)
Over 20 years	25 (16.1)

Note: Values are presented in count (percentage).

Internal consistency. Table 2 displays the internal consistency indices of the Lithuanian KEYS version scales and original KEYS version scales. Cronbach alpha coefficient (Cronbach, 1951): the closer the Cronbach alpha coefficient values to 1, the stronger the internal consistency of the questionnaire dimensions (Vveinhardt, Fominiene, Streimikiene, 2020). The internal consistency of the Lithuanian KEYS version scales was good with Cronbach's alpha ranging from 0.66 to 0.94, with a median of 0.89. The psychometric properties of the Lithuanian KEYS version are nearly the same as of the original KEYS version conducted by Amabile et al. (1996), where Cronbach's alpha varied from minimally acceptable (0.66) to extremely strong (0.91), with a median that is quite good (0.84). Only the 'Freedom' scale showed internal reliability lower than 0.70 as measured by Cronbach alpha in both Lithuanian and original version.

Table 2: Internal consistency of the Lithuanian KEYS version

Scales	No. of items	Alpha LT (N=155)	Alpha KEYS (N=12,100)
Freedom	4	0.66	0.66
Challenging work	5	0.76	0.79
Supervisory encouragement	11	0.93	0.91



Work group supports	8	0.92	0.86
Organizational encouragement	15	0.94	0.91
Organizational impediments	12	0.93	0.84
Sufficient resources	6	0.88	0.83
Workload pressure	5	0.85	0.77
Creativity	6	0.87	0.84
Productivity	6	0.89	0.86

Based on the results, it can be stated that all scales, except for the ‘Freedom’ scale, have good internal reliability (values > 0.7) and do not require additional adjustments to the questionnaire items. This is confirmed by the analysis of the homogeneity of scale statements, which was calculated using Spearman’s correlation coefficient. Calculations of correlations between the estimates of each scale’s items were identified as follows (see Table 3).

Additional results of scale reliability analysis related to internal consistency and Cronbach alpha are presented in Table 3.

Table 3: Additional results related to internal consistency of Lithuanian KEYS version

Scale	Cronbach alpha	95% Confidence Interval		Inter-Item Correlations		
		Lower Bound	Upper Bound	Mean	Min	Max
Freedom	0.66 ^c	0.56	0.74	0.33	0.14	0.47
Challenging work	0.76 ^c	0.69	0.81	0.39	0.22	0.54
Supervisory encouragement	0.93 ^c	0.92	0.95	0.56	0.32	0.80
Work group supports	0.92 ^c	0.89	0.93	0.57	0.45	0.75
Organizational encouragement	0.94 ^c	0.93	0.96	0.53	0.36	0.72
Organizational impediments	0.93 ^c	0.91	0.94	0.51	0.27	0.87
Sufficient resources	0.88 ^c	0.85	0.91	0.56	0.36	0.75
Workload pressure	0.85 ^c	0.81	0.88	0.52	0.36	0.86
Creativity	0.87 ^c	0.84	0.90	0.53	0.41	0.69
Productivity	0.89 ^c	0.87	0.92	0.59	0.42	0.78

Confidence limits of Cronbach alpha coefficients allow us to evaluate expected coefficients’ values in the target population at the usual 95% confidence level. Lower bounds show that only reliabilities of freedom and challenging work scales could be unsatisfactory in the population, maybe less than 0.7 or even 0.6, but not necessarily, as upper bounds show. These two scales not only have relatively low Cronbach alpha coefficients, their average inter-item correlations also are obviously lower than those of the other scales. Internal reliability of remaining eight scales, according to alpha coefficients together with their confidence intervals, could be safely placed above 0.7 and probably even above 0.8 in the population. Minimal inter-item correlations are at least positive for all the scales.



5. ANALYSIS AND DISCUSSION

In the current study, as recommended, guidelines according to international recommendations were employed in order to adapt the questionnaire culturally so that the Lithuanian KEYS version is of good quality and equivalent to its original version. Firstly, several statements and illustrations in the adapted variant were changed as this was required due to the Lithuanian cultural dimensions. The main issues in the translation and cross-cultural adaptation stages were to assess the differences between American and Lithuanian cultures with a particular focus on linguistic differences. In this stage, incorrect or unclear style of the items and incorrectly translated terms were identified, some grammatical errors were found. During the evaluation of the experts' committee, several discrepancies between the semantic and conceptual equivalence of the questionnaire were highlighted. The majority of them were insignificant, related to the choice of a synonymous word. Some essential intercultural semantic inconsistencies and their adjustments are given below.

For example, in order not to mislead respondents who work in the organization with a hierarchical structure, in the items of the 'Supervisory encouragement' scale, the term 'boss' was replaced with 'direct supervisor'. The revised statements aim to evaluate the respondent's direct supervisor, this way avoiding ambiguity that top management may be considered. Following the experts' opinion, the term 'work group' was complemented with the additional word 'team'. In the Lithuanian version of the KEYS questionnaire, the term 'project' was rejected as it was observed that in Lithuanian business culture, project activity was identified as a specific area. Therefore, this term was replaced with 'work', the semantic and conceptual meaning of which corresponds to the definition of the American term 'project'. As the terms 'boss', 'project' and 'work group' were specified, the descriptions of the key terms in the beginning of the questionnaire were refused.

The problem areas also occurred on the 'Productivity' scale, where American terms 'effective' and 'efficient' were used. It was noted that these terms in the Lithuanian language and culture revealed different aspects. For example, the semantic meaning of the American term 'efficient' in the Lithuanian language is more closely reflected by the meaning of the term 'effective'. This is a mismatch of semantic equivalence when the term is translated properly but implies another aspect in another culture. Therefore, the translated version of the statement was inappropriate in the adapted Lithuanian culture, and based on the experts' opinion and experience, Lithuanian equivalents were selected and the adjustments near the items were provided.



In accordance with published guidelines (Guillemin et al., 1993; Beaton et al., 2000), the KEYS questionnaire was submitted to the validation process after translation and cultural adaptation for use with Lithuanian speaking populations. As regards reliability and validity of the Lithuanian KEYS version, the psychometric properties were tested: Cronbach's alpha coefficient to assess the internal consistency. Mostly all scales demonstrated good internal reliability, only freedom and challenging work scales require improvement, maybe by adding more items.

However, further studies are needed to investigate the use of the adapted KEYS version in Lithuania to determine the validity in different industries. If the Lithuanian KEYS version produces stable and consistent results over time, it could also be tested by assessing test-retest reliability. More extensive studies of the Lithuanian KEYS version are necessary to develop normative data among the Lithuanian speaking population.

6. CONCLUSION

The aim of the present study was to translate the KEYS questionnaire and adopt to the Lithuanian speaking population. The choice of the KEYS questionnaire was based on its acceptable scientific quality as well as high utilitarian value (Mathisen & Einarsen, 2004). This study demonstrated that the Lithuanian version of the KEYS questionnaire was well-accepted among Lithuanian-speaking respondents and the scales demonstrated good internal consistency, enabling researchers to estimate the individual work environment perceptions influencing creativity of organizations in the Lithuanian speaking sample. The Lithuanian version of the KEYS questionnaire is easy, understandable and relevant for Lithuanian culture, it is a reliable tool, the results showed that the Lithuanian version of the KEYS questionnaire had good internal consistency. It is to be noted that this is the first and so far, the only available reliable questionnaire in Lithuania assessing work environment for creativity and innovation.

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