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Testing the Validity and Reliability of the Greek Version of General Self-Efficacy (GSE) Scale

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ABSTRACT

Self-efficacy is one of the cornerstone theories in Behavioral Medicine. One relevant self-reported questionnaire is the 'General Self-efficacy (GSE) Scale'. Although this measure has been tested in many cultures, there might be a total absence of studies testing the validity and reliability of the Greek version over the last 30 years. As such, this study aimed to test and present both outcomes. A convenient sample of 192 Greeks from the general population was recruited through the snowball sampling method. The statistical analysis included Pearson's r, Cronbach's alpha, Exploratory Factor Analysis (EFA) with Varimax rotation and an Eigenvalue of 1.5 and regression analysis to test various types of validity. The results show a Cronbach's alpha of .909, suggesting an 'excellent' level. The inter-item correlation matrix shows values between r= .297 and r= .673, and thus considered satisfying. Item-total statistics suggests that if item 2 is deleted then the Cronbach's alpha will increase from .909 to .910. However, item 2 was not excluded from the analysis. The EFA illustrates that GSE has only one component. This finding suggests that there is only one factor in the case of the present study, which is probably related to the background theory of general self-efficacy. The linear regression analysis between GSE and resilience was found at high level confirming the background theory. The results of the present study show a high validity and reliability for the Greek version of GSE, while they are consistent to previous studies that tested GSE in other languages and different populations. It is recommended to clinicians and researcher to use in their practice the Greek version of GSE Scale.

Keywords: General Self-Efficacy Scale, GSE, Psychometrics, Greece, Positive Psychology, Self-Reported Measures

INTRODUCTION

The present article is conducted in order to test and present the validity and reliability of the Greek version of General Self-Efficacy in the general Greek population.

To begin with, 'self-efficacy theory' (SET) was developed by the American psychologist Albert Bandura in the 1970's (see Bandura, 2000). Throughout the years SET established its place in academia and clinical practice in various fields including psychology, medicine, nursing, workforce management and education amongst probably many other (Mauer, 2009). In our days, it is commonly accepted that the interdisciplinary definition of Self-Efficacy refers to the beliefs that any individual may

have about his own abilities and capabilities to deal with any life situation, whether this situation is related for instance to work, health, education or psychological issues (Baker, 2021; Campbell, 2014; Shorey & Lopez, 2021).

In research, many self-reported tools that measure Self-Efficacy have been presented. One of the most used questionnaires is the 'General Self-Efficacy (GSE) Scale' (Rimm & Jerusalem, 1999). The initial questionnaire was developed by Schwarzer and Jerusalem in 1979 (Romppel et al., 2013). Almost 30 years ago, in 1995, the authors who developed the initial scale claimed that GSE was translated in 32 languages (Schwarzer, 2024a.). The GSE was found to be a quite promising scale since it presented a Cronbach's alpha from 75% to 90%, while in most cases GSE showed a value around 80%. (Schwarzer, 2024b).

In the case of Greece, currently the translation of the GSE scale can be found freely online (Glynou et al., 1994). However, there are a few key considerations regarding the available Greek scale. Firstly, the questionnaire was translated 30 years ago, and secondly although many Greek works have referenced the online source of the questionnaire, it is quite unsure if the scale has ever been tested for its validity and reliability in the Greek scale in any other research protocol since its initial introduction. This is quite unlikely since there are not available articles that show any details or any repetitions of the research with different Greek participants throughout the last 30 years. The only reference is that in 1995 the scale had a Cronbach's alpha score of .78 (Schwarzer, 2024b).

Consequently, the present article was conducted to test the validity and reliability of the Greek version of GSE scale.

To answer those questions this study was designed accordingly. The author performed a statistical analysis to test the 'item consistency', 'internal correlation', 'internal consistency', 'factor analysis' and 'predictive validity' of the Greek version of GSE. The design and the statistical analysis were chosen in order to overall test whether the Greek version of GSE can be used in the general Greek population as a psychometric tool that measures general self-efficacy in a valid and reliable fashion after almost 30 years since its original translation.

Lastly, due to the high scores in the Cronbach's alpha test in previous studies, the researcher expected that the Greek version of GSE would present a high score of validity and reliability. Hence, the present study would contribute to the field by encouraging researchers and clinicians to use the Greek version of GSE in the foreseeable future.

MATERIALS & METHODS

Participants

Regarding the demographics, the sample consists of a convenient sample of 192 Greeks, who were recruited through the snowball sampling method. The mean age was found at 33.7 (SD± 12.16). The youngest participant was aged 18 years old and the oldest 67 years old. Further information regarding the socio-demographics are given in Table 1.

Table 1. Summary of socio-demographic details of the participants of the study.

Main Variable	Variable's Subcategories	Total (%) N[a] = 192	Males (%) n = 51, (26.6%)	Females (%) n = 141, (73.4%)	Missing Answers (%)
Education[b]					-
	School Level, (%)	59, (30.7%)	13, (25.5%)	46, (32.6%)	
	Bachelor's Degree, (%)	83, (43.2%)	27, (52.9%)	56, (39.7%)	
	Master's Degree, (%)	45, (23.4%)	10, (19.6%)	35, (24.8%)	
	Doctorate Degree (%)	5, (2.6%)	1, (2%)	4, (2.8%)	
Marital Status					-
	Single, (%)	67, (34.9%)	26, (51%)	41, (29.1%)	

	In relationship, <5 years, (%)	44, (22.9%)	12, (23.5%)	32, (22.7%)	
	In relationship, >5 years, (%)	14, (7.3%)	2, (3.9%)	12, (8.5%)	
	Married, (%)	54, (28.1%)	11, (21.6%)	43, (30.5%)	
	Divorced, (%)	10, (5.2%)	-	10, (7.1%)	
	Widowed, (%)	3, (1.6%)	-	3, (2.1%)	
Children					-
	None, (%)	133, (69.3%)	43, (84.3%)	90, (63.8%)	
	1, (%)	20, (10.4%)	2, (3.9%)	18, (12.8%)	
	2, (%)	29, (15.1%)	4, (7.8%)	25, (17.7%)	
	3, (%)	10, (5.2%)	2, (3.9%)	8, (5.7%)	
Occupation					-
	Unemployed, (%)	15 (7.8%)	1, (2%)	14, (9.9%)	
	School & University Student, (%)	51 (26.6%)	16, (31.4%)	35, (24.8%)	
	Self-Employed/Freelancer, (%)	21 (10.9%)	8 (15.7%)	13, (9.2%)	
	Public Servant, (%)[c]	21 (10.9%)	8, (15.7%)	13, (9.2%)	
	Health Professional, (%)	22 (11.5%)	2, (3.9%)	20, (14.2%)	
	Employee at the private sector, (%)	43 (22.4%)	13, (25.5%)	30, (21.3%)	
	Rentier/Landlord, (%)	2 (1%)	-	2, (1.4%)	
	Retired, (%)	8 (4.2%)	1, (2%)	7, (5%)	
	Disability Pension, (%)	5 (2.6%)	-	5, (3.5%)	
	Other occupation, non specified (%)	4 (2.1%)	2, (3.9%)	2 (1.4%)	
Income[d]					-
	≤ 10,000 €, (%)	73, (38%)	18, (35.3%)	55, (39%)	
	10,001 – 20,000 €, (%)	68, (35.4%)	17, (33.3%)	51, (36.2%)	
	20,001 – 30,000 €, (%)	25, (13%)	6, (11.8%)	19, (13.5%)	
	≥ 30,001 €, (%)	26, (13.5%)	10, (19.6%)	16, (11.3%)	-
Residence					-
	Athens, (%)	169, (88%)	47, (92.2%)	122, (86.5%)	
	Rest Mainland Greece, (%)	7, (3.6%)	2, (3.9%)	5, (3.5%)	
	Greek Islands, (%)	4, (2.1%)	-	4, (2.8%)	
	Other, non specified, (%)	12, (6.3%)	2, (3.9%)	10, (7.1%)	

Notes:
[a] N= total amount of participants
[b] Participants were asked to declare the level of the education, as this had already been achieved
[c] Health professionals consist of a sample of health employees and nurse interns at the General Public Hospital of Nikaia 'Ayios Panteleimon' in Athens, Greece
[d] Participants were asked to declare the level of their income, based on the total annual household income and not based on their individual earnings and contribution to the household expenditures.

Design

The present study was conducted to test the validity and reliability of the Greek version of GSE in the Greek population 30 years after its original introduction. In order to meet the research aims, the authors used Cronbach's alpha analysis, a correlation analysis between the items of the questionnaire, and a factor analysis with an Exploratory Factor Analysis (EFA) with Varimax rotation and an Eigenvalue of 1. The correlation between the rest scales was performed through employing a Pearson's r correlation analysis, while the predictive validity was performed by using a linear regression analysis.

Measures

Self-Efficacy

Self-Efficacy was measured with the Greek version of 'General Self-Efficacy' (GSE) Questionnaire. The original questionnaire was retrieved from Glynou et al. (1994).

The scoring pattern is in Likert scale fashion and the scoring ranges between 1 to 4.

Sympathetic Nervous Adaptation

The levels of stress, anxiety and depression were measured through the Greek adapted version of 'Depression-Anxiety-Stress-21' (DASS-21) questionnaire (Lyrakos et al., 2011). DASS-21 is a self-reported tool with 21 items which are measured via a 0 to 4 scale.

Psychological Resilience

Psychological Resilience was measured through the Greek version of Nicholson McBride Resilience Questionnaire ([NMRQ]; Pilafas et al., 2020). The questionnaire has 12 questions with a self-reported Likert pattern between 1 and 5.

PROCEDURE

The present study is part of a research protocol that tested the levels of psychosomatic symptoms in the general population and health professionals during the second wave of the COVID-19 pandemic in Greece. The study received ethical approval by the scientific Committee of the General Hospital of Nikaia 'Ayios Panteleimon' in Piraeus, Greece. Data collection started in September 2020 and ended in November 2020. The answers of the participants were provided electronically through google forms and through hard copies.

RESULT

Internal Validity

Internal validity was tested via a correlation analysis between the 10 items of the scale. The inter-item correlation matrix shows values between r= .297 and r= .673, and thus considered satisfying since there were no values below .200 and over .800 (Field, 2017). Further details on the analysis are provided in Table 2.

Table 2. Person's r values in correlation analysis between items of GSE. N= 192

Item	1	2	3	4	5	6	7	8	9	10
1	-									
2	.384	-								
3	.452	.347	-							
4	.496	.297	.469	-						
5	.559	.337	.476	.691	-					
6	.57	.399	.362	.523	.562	-				
7	.459	.348	.394	.576	.522	.508	-			
8	.533	.31	.442	.564	.548	.647	.648	-		
9	.613	.397	.411	.504	.515	.595	.567	.673	-	
10	.478	.336	.392	.569	.6	.618	.563	.622	.634	-

Internal Reliability & Consistency

Reliability was tested through Cronbach's alpha analysis. The results show that GSE has a Cronbach's alpha of .909 in the sample of the 192 participants, suggesting an 'excellent' level (Field, 2017)**.** What is more the analysis shows that if item 2 is deleted, Cronbach's alpha score would increase from .909 to .910. Further details are available in Table 3.

Table 3. Cronbach's Alpha if Item Deleted in GSE. N= 192

Item	α
1	.897
2	.91
3	.906
4	.895
5	.894
6	.895
7	.896
8	.892
9	.893
10	.894

Factor Analysis

Factor analysis was performed with EFA with Varimax rotation and an Eigenvalue of 1.5. The results of the analysis show one factor to exist, while all items are loaded to this component with score equal or greater than .528. It is highly recommended that this one factor is general self-efficacy. Table 4 illustrates more details of the analysis.

Table 4. Component Matrix in GSE. N= 192

Item	Component 1
1	.746
2	.528
3	.622
4	.772
5	.787
6	.785
7	.757
8	.818
9	.803
10	.792

Construct Validity

Constrict validity was performed via a Pearson's r correlation analysis between GSE and two other scales. The first scale was DASS-21 and the second one NMRQ. As the theory supports, GSE was expected to be negatively correlated with DASS-21 (stress, anxiety and depression) and positively correlated with NMRQ (psychological resilience). Indeed, the correlation analysis conformed to the later hypothesis. More details are provided in Table 5.

Table 5. Correlations between GSE and other scales. N= 192

		DASS-21	**NMRQ**
GSE	Pearson's r	-.386	.712
	p-value	<.001	<.001

Predictive Validity

Predictive validity was performed through a single linear regression, as GSE was used as the predictor of NMRQ. In the analysis GSE predicted 50.5% of the variance of NMRQ. The ratio may be considered large, as in behavioral sciences a percentage greater than 26% is considered high, while the closer it gets to 100% the more likely it is the two variables measure the same component (Pilafas & Lyrakos, 2021). The predictive ratio may suggest that indeed self-efficacy and resilience are closely related as in the background theory of positive psychology suggests (Baluszek et al., 2023; Galindo-Domínguez et al., 2020).

DISCUSSION

The present study was conducted to test whether GSE is a reliable and valid self-reported measure in the Greek population. The authors of this study claim that the reliability and validity of GSE was tested almost 30 years ago, and as a result the high scores that were presented at that time may reflect only that particular juncture. As part of a larger research protocol, GSE was tested for its reliability and validity in 192 Greeks from the general population. The results illustrate a clear high level of reliability and validity of GSE in this study.

The results of the present study are consistent with previous studies which provide evidence about the high reliability and validity of GSE. More specifically, Schwarzer and Jerusalem, the researchers who originally developed GSE, present that the Cronbach's alpha scores of GSE was found between .78 and .91 (see Schwarzer, 2024b) in samples from Hong Kong (n = 1,068), Indonesia (N= 536), Japan (N= 430), Korea (N= 147), Syria (N= 264), Russia (N= 495), Poland (N= 570), Hungary (N= 158), Greece (N= 100), Germany (N= 2,129), the Netherlands (N= 697), the UK (N= 219) and Costa Rica (N= 955). It is noteworthy that the authors concluded that in all languages GSE shows one factor (Schwarzer, 2024b). Regarding the lowest score of .78 at that study, it was found in the case of Greece. Although .78 suggests a high score in Cronbach's alpha analysis, the present study shows a higher level at .909. Therefore, regardless of the course of almost 30 years, GSE seems to be reliable and valid even in our days (Field, 2017).

Furthermore, in the source that presents the scores of GSE in 14 languages, the internal consistency of GSE seems to be equally strong in all 13 samples, since in no case the r value is below .24 (Schwarzer, 2024b). In the Greek sample the relevant scores range between .24 and .56. In the present study the r values range a little higher as the lowest was found at .297 and the highest at .673. This difference between the two Greek samples may explain partly the difference in the Cronbach's alpha scores between them.

Moreover, in the present study GSE predicted a high number of the variance of NMRQ. As the two variables were positively correlated in the analysis, it is quite likely that this result shows that GSE does indeed measure self-efficacy from a theoretical perspective. In the background theory, self-efficacy and resilience are likely to play an intrigued role in increasing wellbeing (Baluszek et al., 2023; Galindo-Domínguez et al., 2020).

As far as the proposed use of the Greek version of GSE is concerned, it is reflected that this questionnaire may be used to the general Greek population as a valid and reliable self-reported measure. It is also considered that Greek patients may answer this questionnaire in order for mental professionals to measure and understand whether they would have to receive any parallel support and intervention.

Considering the limitations of the present study, it is noteworthy that the sample consists mostly of female participants, as well as most of the participants were residents of Athens, Greece. In addition, data collection took place during the second wave of COVID-19 in Greece. This may result in increased levels of scores in DASS-21 as well as mean scores in GSE and NMRQ that do not reflect the relevant scores in every-day life conditions in the general population in Greece.

Regarding future studies, there is an absence of scientific evidence between GSE and health-related issues in Greece. Therefore, it is reflected that future scientific works in Greece may design studies to answer relevant questions. Moreover, the same analysis may take place in non-COVID-19 conditions and any results may be compared to this study.

CONCLUSION

To conclude, the present study took place to test the validity and reliability of the Greek version of GSE 30 years after its initial introduction. The overall statistical outcome of the present study shows that the Greek version of GSE show high levels of validity and reliability in a sample of 192 Greeks from the general population. Those results are consistent with previous studies that are provided by the developers of GSE, as well as they are also consistent with the initial Greek study that introduced the questionnaire 30 years ago. Thus, it is recommended that the Greek version of GSE may be used to the Greek general population in future studies and clinical practice. Future studies may try to retest the outcome.

Declaration by Authors

Ethical Approval: Not Applicable

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Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Baker, K. (2021a). Commentary: The creation of a confidence scale: the confidence in managing challenging situations scale. *Journal of Research in Nursing*, *26*(6), 497–498. https://doi.org/10.1177/1744987120979709
2. Baker, K. (2021b). Commentary: The creation of a confidence scale: the confidence in managing challenging situations scale. *Journal of Research in Nursing*, *26*(6), 497–498. https://doi.org/10.1177/1744987120979709

3. Baluszek, J. B., Brønnick, K. K., & Wiig, S. (2023). The relations between resilience and self-efficacy among healthcare practitioners in context of the COVID-19 pandemic – a rapid review. *International Journal of Health Governance*, *28*(2), 152–164. https://doi.org/10.1108/IJHG-11-2022-0098
4. Bandura, A. (2000). Self-efficacy. In *Encyclopedia of psychology, Vol. 7.* (pp. 212–213). American Psychological Association. https://doi.org/10.1037/10522-094
5. Field, A. (2017). *Discovering Statistics Using IBM SPSS Statistics*. SAGE.
6. Galindo-Domínguez, H., Pegalajar, M., & Uriarte, J.-D. (2020). Mediator and moderator effect of *resilience* between *self-efficacy* and *burnout* amongst social and legal sciences faculty members. *Revista de Psicodidáctica (English Ed.)*, *25*(2), 127–135. https://doi.org/10.1016/j.psicoe.2020.04.001
7. Glynou, E., Schwarzer, R., & Jerusalem, M. (1994). *Greek Adaptation of the General Self-Efficacy Scale*. https://userpage.fu-berlin.de/%7Ehealth/greek.htm
8. Lyrakos, G. N., Arvaniti, C., Smyrnioti, M., & Kostopanagiotou, G. (2011). Translation and validation study of the depression anxiety stress scale in the greek general population and in a psychiatric patient's sample. *European Psychiatry*, *26*(S2), 1731–1731. https://doi.org/10.1016/S0924-9338(11)73435-6
9. Mauer, R., Neergaard, H., & Kirketerp Linstad, A. (2009). Self-Efficacy: Conditioning the Entrepreneurial Mindset. In A. L. Carsrud & M. Brännback (Eds.), *Understanding the Entrepreneurial Mind: Opening the Black Box* (pp. 233–257). Springer. https://doi.org/10.1007/978-1-4419-0443-0_11
10. Pilafas, G., Strongylaki, N. P., Papaioannou, D., Menti, D., & Lyrakos, G. (2020). Adaptation of 'Nicholson McBride Resilience Questionnaire' (NMRQ) in Greek. A reliability and validity study in an epidemiological Greek sample. *Health & Research Journal*, *6*(4), Article 4. https://doi.org/10.12681/healthresj.25629
11. Rimm, H., & Jerusalem, M. (1999). Adaptation and validation of an estonian version of the general self-efficacy scale (ESES). *Anxiety, Stress, & Coping*, *12*(3), 329–345. https://doi.org/10.1080/10615809908250481
12. Romppel, M., Herrmann-Lingen, C., Wachter, R., Edelmann, F., Düngen, H.-D., Pieske, B., & Grande, G. (2013). A short form of the General Self-Efficacy Scale (GSE-6): Development, psychometric properties and validity in an intercultural non-clinical sample and a sample of patients at risk for heart failure. *GMS Psycho-Social-Medicine*, *10*, Doc01. https://doi.org/10.3205/psm000091
13. Schwarzer, R. (2024a). *General Self-Efficacy Scale (GSE)*. Retrieved 2 July 2024, from https://userpage.fu-berlin.de/~health/selfscal.htm
14. Schwarzer, R. (2024b). *Self-Efficacy Assessment*. General Perceived Self-Efficacy in 14 Cultures. Retrieved 2 July 2024, from https://userpage.fu-berlin.de/~gesund/publicat/ehps_cd/health/world14
15. Shorey, S., & Lopez, V. (2021). Self-Efficacy in a Nursing Context. In G. Haugan & M. Eriksson (Eds.), *Health Promotion in Health Care – Vital Theories and Research* (pp. 145–158). Springer International Publishing. https://doi.org/10.1007/978-3-030-63135-2_12

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