

PSYCHOMETRIC PROPERTIES of the GENERAL SELF-EFFICACY SCALE In a COLOMBIAN SAMPLE

PROPIEDADES PSICOMÉTRICAS DE LA ESCALA DE AUTOEFICACIA
GENERALIZADA EN UNA MUESTRA COLOMBIANA

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ABSTRACT

The self-efficacy construct has been studied from two different viewpoints. Firstly, in a specific manner, as it was originally proposed and secondly, in a generalized way, defined as an optimistic self-belief of personal capability to cope efficiently and competently with a variety of situations. In order to measure this construct at the broadest level the General Self Efficacy Scale (GSE) was designed and adapted to Spanish in Costa Rica. This study aimed at validating the scale in a Colombian sample composed of college students. Participants were also administered the Situational Personality Questionnaire (named in Spanish as *Cuestionario de Personalidad Situacional*, CPS) and its factors have, theoretically speaking, a certain relationship with the studied construct. According to the results, the GSE showed a high internal consistency (Cronbach's alpha value of .83). Convergent and discriminant validity of this instrument were evaluated through the CPS and positive correlations were obtained with efficacy, confidence, self-concept and emotional stability while negative correlations were obtained with anxiety. Through exploratory and confirmatory factor analysis, the unidimensional structure of the scale was validated.

Keywords: Self-efficacy, scale, reliability, validity, confirmatory factor analysis.

RESUMEN

El constructo de autoeficacia ha sido estudiado desde dos perspectivas distintas; de manera específica como se propuso originalmente, y de forma generalizada, definida como las creencias del individuo sobre su actuación eficaz y competente ante diversas situaciones. Para medir el constructo de forma generalizada se diseñó la Escala de Autoeficacia Generalizada (EAG) adaptada al castellano en Costa Rica. El propósito de este estudio fue validar la escala en una muestra colombiana de estudiantes a quienes también se les aplicó el Cuestionario de Personalidad Situacional (CPS), cuyos factores guardan teóricamente cierta relación con el constructo estudiado. De acuerdo con los resultados la EAG presentó una alta consistencia interna (Alfa de Cronbach de .83). Las validez convergente y discriminante del instrumento evaluado mediante el CPS, arrojó correlaciones positivas con las dimensiones de eficacia, confianza, autoconcepto y estabilidad emocional y de manera negativa con ansiedad. Mediante análisis factoriales exploratorio y confirmatorio se validó la estructura unidimensional de la escala.

Palabras clave: Autoeficacia, escala, fiabilidad, validez, análisis factorial confirmatorio.

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Self-efficacy (Bandura, 1977, 1986, 1997) has been one of the most widely studied psychological constructs (Bandura, 2000). It is the core component of the most highly regarded social-cognitive theory of recent decades (Forsyth & Carey, 1998; Lent & Maddux, 1997). Self-efficacy has been defined as an environmental and self-referential variable. It was proposed by Bandura and it refers to the belief that one has the capability to organize and execute the courses of action required to obtain any given result (Bandura, 1986). Self-efficacy judgments may become predictors of behavior (Pajares & Schunk, 2001). They can influence thinking, emotion, action and control perception over critical life situations and events, which, in general terms, improves human functioning (Bandura, 1995; Schwarzer, 1992).

The self-efficacy construct has received growing empirical support from various fields of knowledge. In health psychology it has been widely considered and applied to various areas such as chronic disease management (O'Leary, Shoor, Lorig, & Holman, 1988), physical exercise (Bernier & Avard, 1986), immune response to stress (Bandura, 1992; O'leary, 1992), physical functioning and pain perception (Almaier, Russell, Kao, Lehmann, & Weinstein, 1993), response to medical treatments and functional recovery for daily activities (Kaplan, Atkins, & Reinsch, 1984), healthy behaviour adoption (Bandura, 1992), adoption of safer sex practices (Raj, 1996; O'Leary, 1992), control of high-risk sexual behaviour and addictions (Kleinman, Millery, Scimeca, & Polissar, 2002) and alcohol and tobacco consumption (Christiansen, Vik, & Jarchow, 2002) (Becona, Frojan, & Lista, 1988; Carey & Carey, 1993).

Self-efficacy has been conceptualized both as a general and a specific construct. Bandura does not consider it to be a trait-like generalized belief but rather a specific belief about one's capability to successfully carry out certain behaviors in a given situation. That is why self-perceived efficacy is commonly understood as being domain-specific and it must be evaluated through instruments measuring particular domains which are thought to be better predictors of behaviour (Wang & Richarde, 1988).

Other authors such as Schwarzer y Fuchs (1995), who have extensively studied this construct, conceptualize it in a broader and more global sense. They see it as composed of significantly successful and failed events and they refer to it as generalized self-efficacy, defined as people's beliefs about their competence to deal

effectively with a variety of situations. In this sense, generalized self-efficacy is conceptualized as a strong sense of personal efficacy (Schwarzer & Fuchs, 1995), a stable sense of competence to cope efficiently with stressful situations (Baessler & Schwarzer, 1996), including judgements about one's own capability to affect the social environment (Jerusalem & Schwarzer, 1992). Lent and Maddux (1997) stress the need to expand the general self-efficacy theory to various domains just as it has been done with the self-efficacy understood as a more specific concept.

Generally speaking, research has shown a high correlation between self-efficacy and behaviour and it has also provided evidence that self-efficacy is a more consistent predictor of behavior than other motivational constructs (Graham & Weiner, 1996). Either considered as a specific or a general construct, self-efficacy is a conviction of competence based on self-evaluation –coming from different sources– of one's own skills (Bandura 1989). Specifically, it is an individual's personal belief regarding his/her ability to produce an effect (Bandura, 1994).

Matthias Jerusalem and Ralf Schwarzer designed the General Self-efficacy Scale in 1981 (GSE) to evaluate this construct as a broad personality disposition. The GSE - originally developed in German - is a psychometric instrument that can be administered individually or collectively. Its latest version contains 10 items with four possible responses on a 4-point scale (1 = Not all true, 2 = Hardly true, 3 = Moderately true, 4 = Exactly true) (Jerusalem & Schwarzer, 1992). This scale has been widely used in numerous studies and adapted to several languages, being Spanish one of them. Its scales have been validated and typically yielded (Schwarzer, Bassler, Kwiatek, Schroder & Zhang, 1997) a high internal consistency (Cronbach's alpha between .79 and .93) and a high degree of validity in terms of convergent and discriminant validation.

The self-efficacy scale has been translated into more than 25 languages. Initially, only psychometric properties of the German version were evaluated through five studies. Then, it was adapted to English, French, Hebrew, Hungarian, Turkish, Czech and Slovenian. Next, the psychometric properties of the scale were compared between 14 cultures with 13 languages (12.840 subjects) including versions in German, English, Dutch, Spanish, Russian, Greek, Arabic, Hungarian, Polish, Chinese, Indonesian, Japanese and Korean. These studies yielded a high

internal consistency and correlation with the total score of items. Cronbach's alpha for these versions ranged from .78 (Greek version) to .91 (Japanese version) (Schwarzer, 1998).

Standardization of the Spanish version was carried out by Judith Baessler in Costa Rica. A group of bilingual students translated the German and English scales into Spanish and performed several direct and back translations comparing their versions with the ones of the other members of the group (Baessler & Schwarzer, 1996). To prevent the subjects from identifying the construct that was being evaluated, the ten items of the scale were randomly included in a general questionnaire measuring different aspects. The sample consisted of 943 Spanish speakers, who were students at the University of Costa Rica located in the capital (San José). This is the largest university of the country. Participants were enrolled in 12 different programs; 595 subjects were women and 346 were men, the average age being 21.3 and 21 respectively.

When comparing three versions of the scale applied in German (Germany), Spanish (Costa Rica) and Chinese (Hong Kong), the scale showed to be homogeneous, unidimensional and universally valid across different cultures. A high positive correlation has been found with self-esteem and optimism and a negative correlation with anxiety, depression and physical symptoms (Schwarzer, 1998).

Considering that the GSE has been found to have good psychometric properties in many countries, this study aimed at validating the scale in a Colombian sample as well as comparing local results with the ones obtained in the above mentioned countries. The Situational Personality Questionnaire (*Cuestionario de Personalidad Situacional*) was used to analyze convergent and discriminant validity of the instrument (Fernández-Seara, Seisdedos, & Mielgo, 1998).

METHOD

Participants

The sample was composed of 690 undergraduate psychology students of both genders (76% female and 24% male) ranging from first to tenth-semester students who attended a private college in the city of Bogotá (Colombia). The mean age of participants was

22. Most of them were single (87 %) and were from government established socioeconomic levels 3 (60%) and 4 (23 %), considered middle and upper-middle class, respectively. Students voluntarily completed the instruments and they were not offered any compensation for participation.

Instruments

The GSE scale was adapted to Spanish in Costa Rica by Baessler, Schwarzer and Jerusalem in 1993 (Baessler & Schwarzer, 1996). This tool was made up of 10 statements describing situations to which the examinee would answer to on a 4-point Likert scale (1 = Not all true, 2 = Hardly true, 3 = Moderately true, 4 = Exactly true). The scale produces a total score ranging from 10 to 40. The GSE is a short instrument, which has proved to be highly reliable and valid to measure generalized self-efficacy.

The Situational Personality Questionnaire (CPS) was developed by Fernández-Seara, Seisdedos & Mielgo, (1998), with the aim to assess 15 personality traits and 3 styles or behavioral trends, the latter being validity measures for answers. It consists of 233 items (with a dichotomic false-or-true format), some of which score in more than one scale, due to the fact that many of those traits are related to each other in the personality structure and are dependent from the situations within which they are embodied.

Personality variables and behavior trends and their maximum scores possible measured by the CPS are as follows: a) emotional stability (26), b) anxiety (25), c) self-concept (25), d) efficacy (25), e) self-confidence and self-assurance (24), f) self-sufficiency (19), g) dominance (24), h) cognitive control (23), i) sociability (25), j) aggressiveness (21), k) social adjustment (19), l) tolerance (19), m) social intelligence (20), n) integrity/honesty (25), o) leadership (19), p) sincerity (21), and q) social desirability (28). Additionally, the CPS includes a validity/control scale (Cnt) to assess participants' responses. In terms of accuracy and according to test-retest assessments, not one coefficient was below .88, and in more than half of the scales, coefficients were equal or above .90, except with the validity scale (Cnt). Moreover, the CPS exhibits an adequate validity.

Procedure

Previously authorized by the Faculty of Psychology where the study was to be carried out, and after having obtained the participant's informed consent, instruments began to be administered. Collective tests were provided to about 35 people, who were required to complete the instrument individually and anonymously (they were asked not to provide their names). Approximate time to respond to the instruments was 35-40 minutes.

RESULTS

Table 1 displays the results obtained by participants in the CPS and GSE dimensions. In the latter, the mean score obtained was 32.07 (*S.D.*=5.25), which places it in a high-ranked category (*Max.*=40). Scores obtained in the CPS are high for integrity (mean score 18.81), efficacy (mean score 17.84) and desirability (mean score 17.74). In turn, the lowest scores were obtained for control (mean score 8.17), sincerity (mean score 9.88), self-sufficiency (mean score 9.89) and aggressiveness (mean score 9.90).

Table 1. Scores obtained by participants in the CPS and the GSE

	<i>Min</i>	<i>Max</i>	\bar{X}	<i>SD</i>
CPS				
Emotional stability	0	25	12.32	5.36
Anxiety	2	25	15.12	4.77
Self-concept	2	25	15.70	4.97
Efficacy	3	25	17.84	4.21
Confidence	2	24	15.22	4.81
Self-sufficiency	2	19	9.89	2.80
Dominance	0	155	12.54	7.00
Cognitive control	1	118	16.35	5.32
Sociability	2	125	15.51	6.32
Social adjustment	1	21	10.88	2.87
Aggressiveness	0	21	9.90	4.10
Tolerance	0	19	10.69	3.54
Social intelligence	5	20	14.58	3.11
Integrity	4	25	18.81	3.60
Leadership	1	19	11.48	3.74
Sincerity	0	22	9.88	3.65
Desirability	4	28	17.74	5.24
Control	1	17	8.17	1.94
GSE				
Total self-efficacy	14	40	32.08	5.23

The GSE scale showed a high internal consistency with a Cronbach's alpha value of .83 Table 2 shows a correlation of each item with the scale's total. It allows visualizing an adequate correlation for each of them, except for the first one, which exhibits a slightly reduced correlation.

Table 2. Scores obtained in each GSE' s items and correlation with total score

Item	<i>Min</i>	<i>Max</i>	\bar{X}	<i>SD</i>	<i>r</i>
1	1	4	2.98	.99	.2997
2	1	4	3.61	.69	.4287
3	1	4	3.34	.78	.4304
4	1	4	3.20	.82	.6065
5	1	4	3.17	.84	.6042
6	1	4	2.92	.94	.5803
7	1	4	3.04	.85	.6552
8	1	4	3.45	.72	.5380
9	1	4	3.17	.79	.6039
10	1	4	3.19	.81	.5319

In order to assess the number of dimensions contained in the GSE, a factor analysis of the main components was conducted. A single explanatory dimension accounting for 41.41% of the variance was found. The second factor accounted only for 10%. To verify the scale unidimensionality, a confirming factor analysis was carried out, considering a model with one latent variable and 10 indicators. Results yielded a χ^2 from 300.00 (*g.l.*=35, *p*=.000), and even though the model was significantly different, goodness of fit measurement was adequate ($\chi^2/g.l.$ =8,571, *RMR*=.036; *GFI*=.918; *AGFI*=.871).

Correlations obtained through the CPS to determine the instrument validity can be observed in Table 3. Moderate correlations were obtained with efficacy and confidence dimensions (.353 and .364, respectively, *p*=.000). Anxiety dimension yielded a negative correlation of -.304 (*p*=.000), while self-concept resulted in a correlation of .423 (*p*=.000) and emotional stability yielded a correlation of .319 (*p*=.000).

Appendix A presents the scales for the resulting sample, z-scores and t-scores were obtained per each total score resulting from the GSE.

Table 3. Correlation coefficients between total GSE and CPS dimensions

CPS dimensions	Total GSE	<i>p</i>
Emotional stability	.319	.000
Anxiety	-.304	.000
Self-concept	.423	.000
Efficacy	.353	.000
Confidence	.364	.000
Independence	.099	.008
Dominance	.152	.000
Cognitive control	.203	.000
Sociability	.160	.000
Social adjustment	.102	.007
Aggressiveness	-.060	.114
Tolerance	.044	.247
Social intelligence	.0221	.000
Integrity	.198	.000
Leadership	.315	.000
Sincerity	-.018	.635
Desirability	.311	.000
Control	.119	.002

DISCUSSION

As Baessler and Schwarzer (1996) suggest, good results obtained among the Spanish speaking population in Costa Rica should be coupled with other studies in similar populations. This has been the aim of the present study. Such an approach has resulted in satisfactory indicators regarding the GSE psychometric properties. Thus, both scale unidimensionality and accuracy have been verified (the first one with an explanatory factor of 41.41 percent, and the second one with a Cronbach's alpha of .83). Correlations of items with the scale total score are, most of them, higher than those obtained by Baessler and Schwarzer (1996).

On the other hand, the confirming factor analysis is significant. Although the model's goodness-of-fit indicators are good, the model is not verified. That might be due to the size of the sample, since greater samples tend to reject the model, based on χ^2 , even if it is correct (Mulaik et al., 1989). Goodness-of-fit indicators are adequate; although AGFI approaches .90, according to several authors, this indicator should be above that value and so it is improvable (Bentler & Bonnet, 1980).

The instrument convergent and discriminant validity has been assessed through correlations resulting from the CPS, where those dimensions more closely related to self-efficacy obtained moderate correlations, such as efficacy (.353) and confidence (.364). Conversely, the anxiety dimension showed a negative correlation (-.304) and so did aggressiveness (-.060). This establishes a difference with concepts that have shown either an inverse relation to self-efficacy, such as aggression and pro-social self-efficacy (Erdley & Asher, 1996), or inverse performance effects, such as anxiety and self-efficacy (Contreras et al., 2005).

According to these results, the GSE applied to the Colombian sample analyzed in this work shows adequate psychometric properties.

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APPENDIX A
SCALES ON THE GENERALIZED SELF-EFFICACY SCALE (GSE)

Total GSE	<i>z</i>	<i>T</i>
14	-3.46	15.43
15	-3.27	17.34
16	-3.07	19.25
17	-2.88	21.17
19	-2.50	24.99
20	-2.31	26.90
21	-2.12	28.81
22	-1.93	30.73
23	-1.74	32.64
24	-1.54	34.55
25	-1.35	36.46
26	-1.16	38.37
27	-.97	40.29
28	-.78	42.20
29	-.59	44.11
30	-.40	46.02
31	-.21	47.93
32	-.02	49.85
33	.18	51.76
34	.37	53.67
35	.56	55.58
36	.75	57.50
37	.94	59.41
38	1.13	61.32
39	1.32	63.23
40	1.51	65.14