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Self-Change Strategies in Smokers and Former Smokers: Spanish Adaptation of the SCS-CS and SCS-FS

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The purpose of this study was to validate and adapt the Self-Change Strategies in Current Smokers (SCS-CS) and the Self-Change Strategies in Former Smokers (SCS-FS) (Christie & Etter, 2005) to the Spanish population. We also wished to analyze the differences in the self-change strategies used as a function of gender. Participants were 370 subjects (190 smokers and 180 former smokers) who were recruited by means of the "snowball" method. The alpha coefficients for the SCS-CS and the SCS-FS were .86 and .87, respectively. Both scales present satisfactory psychometric properties, so they are shown to be useful instruments to use in the Spanish population. The SCS-CS score showed that male smokers used more self-change strategies than females (46.6 vs. 11.9, $p < .01$), specifically, more cognitive strategies. In the SCS-CS, men scored higher than women (49 vs. 12.08, $p < .01$), in both the group of cognitive and behavioral strategies. The psychological mechanisms used to control the smoking habit are the same in men as in women, but the men tend to use a larger number of strategies. Treatments to quit smoking do not need to be substantially different, but they should be more intensive in the case of women smokers.
Keywords: smoking-cessation, self-change, psychometric-scales, gender.

El objetivo de este estudio fue validar y adaptar a la población española la Self-Change Strategies in Current Smokers (SCS-CS) y la Self-Change Strategies in Former Smokers (SCS-FS) (Christie & Etter, 2005). También tratamos de analizar las diferencias de las estrategias de autocambio empleadas en función del género. Participaron 370 sujetos (190 fumadores y 180 exfumadores) que fueron reclutados mediante el método "bola de nieve". Los coeficientes alfa para las escalas SCS-CS y SCS-FS fueron de 0,86 y 0,87 respectivamente. Ambas escalas presentan, por tanto, buenas propiedades psicométricas, por lo que se muestran como instrumentos útiles para utilizar en población española. La puntuación en la SCS-CS mostró que los hombres fumadores utilizan más estrategias de autocambio que las mujeres (46,6 frente a 11,9) (p<0,01), en particular, más estrategias de tipo cognitivo. En la escala SCS-FS, los hombres volvieron a puntuar más alto (49 frente a 12,08) (p<0,01), tanto en el grupo de estrategias cognitivas como en las conductuales. Los mecanismos psicológicos que se emplean para controlar el hábito de fumar son los mismos en hombres que en mujeres, pero los hombres tienden a utilizar mayor número de estrategias. Los tratamientos para dejar de fumar no deben ser sustancialmente diferentes, aunque sí más intensivos en el caso de las mujeres fumadoras..
Palabras clave: abandono del tabaquismo, autocambio, escalas psicométricas, género.

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Tobacco consumption is one of the main public health problems in Spain. The percentage of consumers who report daily use of tobacco is around 33% (Plan Nacional sobre Drogas, 2007). Faced with this reality, it is obvious that we need to develop effective strategies, both for the prevention and treatment of the addiction to nicotine.

However, despite the fact that there are effective psychological treatments to cease smoking, only a minority of smokers (about 7%) participate in formal programs offered by specialists (Baker, Fox, & Hasselblad, 2000; Hughes, 1995). This may be due to the scarce availability of these programs or, perhaps, to the general viewpoint that, although therapies are necessary for other types of addictions (for example, alcoholism), this does not hold for tobacco-addiction (Hughes, 1995).

The most usual way of recovery for people who quit smoking is, therefore, self-change or natural recovery (Klingemann & Sobell, 2007), and many authors suggest that the development and improvement of therapeutic and preventive strategies could benefit from the study of the characteristics, determinants, and processes involved in the recovery of people who do not undergo any kind of treatment (Etter, Bergman, & Perneger, 2000; Prochaska, DiClemente, & Norcross, 1992).

Important models have emerged from the study of people who quit smoking by themselves, such as the well-known transtheoretical model (TTM) of Prochaska and Diclemente and the States of change (Prochaska, Crimi, Lapsanski, Martel, & Reid, 1982; Prochaska & DiClemente, 1983, 1984; Velicer, Norman, Fava, & Prochaska, 1999). The TTM is a comprehensive theory of behavior change that describes individual movement through a series of five stages. Precontemplation is characterized by resistance to recognizing and modifying a problem behavior. Precontemplators have no intention of changing their behavior in the next 6 months. Contemplators are individuals who are seriously considering changing in the next 6 months. They recognize the problem and know what they want to do, but they are just not ready to act. Both intentions to take action in the near future (next 30 days) and small behavioral changes characterize the preparation stage. The action stage is where behavior is being performed at the criterion level, but this change has taken place within the last 6 months. Maintenance, where long-term change has been achieved and is being integrated within the individual's behavior set.

Some authors have proposed and developed assessment instruments of self-change strategies in smokers and former smokers in order to further our knowledge of the characteristics of natural recovery. In particular, Etter and his colleages (Etter, Bergman, Humair, & Perneger, 2000a; Etter, Bergman, & Perneger, 2000b) developed two scales in French to assess self-change strategies, which have subsequently been successfully translated to English, the *Self-Change Strategies in Current Smokers (SCS-CS)* and the *Self-Change Strategies in Former Smokers (SCS-FS)* (Christie & Etter, 2005).

Currently, there are no reliable data from the Spanish population related to the rates and characteristics of natural recovery from the addiction to nicotine. Therefore, one of the goals of the present study is to validate and adapt the SCS-CS and the SCS-CS to the Spanish population. The second goal was to analyze the differences in self-change strategies as a function of gender, along the lines of some previous studies in which notable differences between men and women were found (Etter, Prokhorov, & Perneger, 2002). If such differences are confirmed, this might imply the need to adapt tobacco dependence treatments as a function of patients' demographic profile.

Method

Participants

A total of 370 participants were recruited by means of intentional sampling to participate in this study, using the "snowball" technique. Of the sample, 190 were smokers and 180 were former smokers. Inclusion criteria were: (a) to smoke at least 10 cigarettes a day and (b) to have been smoking currently for 1 year or longer or, in the case of the former smokers, in the past.

The smokers' mean age was 31.52 years (*SD* = 12.44), whereas in the former smokers, it was 37.69 (*SD* = 13.26). Of the smokers, 38.4% were men and 61.6% were women. In the case of the former smokers, the percentage of men exceeded that of the women, 55.6% versus 44.4%.

Measurements

Two different instruments were used—one for smokers and the other for former smokers—which assessed self-change strategies for tobacco consumption.

For the smokers, we used the *Self-Change Strategies in Current Smokers (SCS-CS)* of Etter, Bergman, & Perneger (2000b). This instrument has 19 items that are rated on a 5-point Likert scale, ranging from 1 (*never*) to 5 (*frequently*), depending on the frequency with which the strategies are used. The 19 items are grouped into 5 factors that correspond to certain processes of change of the transtheoretical model: Commitment to change, Taking control, Risk appraisal, Help from others, and Coping with the temptation to smoke (Etter, Bergman, & Perneger, 2000). The strategies most frequently used by the smokers who are in the stages of precontemplation and contemplation are Taking control and Coping with the temptation to smoke. During the stages of contemplation and preparation, the most frequently used are Coping with the temptation to smoke and Risk appraisal.

For the former smokers, we used the *Self-Change Strategies in Former Smokers (SCS-FS),* also developed by Etter, Bergman, & Perneger (2000b). This 17-item test represents self-change strategies and, as before, they are rated on a Likert

scale, ranging from 1 to 5, depending on the frequency with which the strategies are used. The 17 items of this scale are grouped into 5 factors that also correspond to five processes of change, as in the case of the instrument for smokers. The scale factors are: Risk appraisal, Coping with the temptation to smoke, Stimulus control, Self-reappraisal, and Commitment to change (Etter, Bergman, & Perneger, 2000). The strategies most frequently used among the former smokers who are between action and maintenance stages are Coping with the temptation to smoke and Commitment to change.

We also analyzed the reliability of the instruments and the diverse factors that comprise them and we carried out factor analyses in order to determine whether the factor structures found previously are maintained in the Spanish population.

Procedure

The SCS-CS and the SCS-FS scales were translated from English to Spanish by two independent translators, one of them a professional translator and the other an expert in psychology of addictions, a method used in previous research about the self-change in substance abuse (Babor et al., 1994; Carballo et al., 2008; Room, Janca, Bennett, Schmidt, & Sartorius, 1996; Sobell, Klingemann, Toneatto, Sobell, Agrawal, & Leo, 2001).

The instruments were administered by doctorate psychology students from the University of Oviedo. These students were trained in the use of the instruments and were informed about the inclusion criteria so they could perform an initial selection of the participants in the study. From this initial sample, more subjects were included depending on whether or not they met the established inclusion criteria.

Data Analysis

Cronbach's alpha was used for reliability analysis of the instruments. Alpha values had to be equal to or higher than .07 to be acceptable (Nunnally & Bernstein, 1994). In order to analyze whether the factor structures of both instruments are maintained in the Spanish population, we performed a principal components factor analysis with Varimax rotation.

To compare self-change strategies and change processes as a function of gender, we used Student's *t*-test for independent samples, with a 95% confidence level. In order to compare the diverse factors of the scale, the scores were transformed linearly to a scale ranging from 1 to 20 points.

The data were coded and analyzed by means of the SPSS 15.0 statistical package.

Results

Reliability

The alpha coefficient for the SCS-CS was .86. As can be seen in Table 1, four of the five factors have coefficients higher than .70. Only Taking control—with α = .49—was below the criterion of .70.

The alpha coefficient for the SCS-FS was .87. As in the previous case, four of the five factors obtained coefficients higher than .70. In this case, Commitment to change was the only factor that was lower than .70, although it was close to this value (α = .62).

Table 1
Reliability coefficients of the SCS-CS and the SCS-FS

	Cronbach's alpha
Total SCS-CS	.86
Commitment to change	.83
Taking control	.49
Risk appraisal	.81
Help from others	.73
Coping with the temptation to smoke	.72
Total SCS-FS	.87
Risk appraisal	.81
Coping with the temptation to smoke	.75
Stimulus control	.71
Self-reappraisal	.70
Commitment to change	.62

Table 2
Factor structure of the SCS-CS

	Factors				
	F1	F2	F3	F4	F5
ítem1	.372				
ítem2	.589				
ítem3	.212				
ítem4	.261				
ítem5	.763	.143			
ítem6		.565			
ítem7		.214			
ítem8		.467			
ítem9		.801			
ítem10			.749		
ítem11			.780		
ítem12			.694		
ítem13			.832		
ítem14				.822	
ítem15				.796	
ítem16				.620	
ítem17					.734
ítem18					.663
ítem19					.744

F1: Commitment to change; F2: Taking control; F3: Risk appraisal; F4: Help from others; F5: Coping with the temptation to smoke

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Table 3
Factor structure of the SCS-FS

	Factors				
	F1	F2	F3	F4	F5
item1	.866				
item2	.819				
item3	.489				
item4	.727				
item5		.862			
item6		.195			.839
item7		.862			
item8		.579			
item9			.810		
item10			.488		
item11			.669		
item12			.541	.623	
item13				.788	
item14				.769	
item15					.862
item16				.757	.124
item17					.388

F1: Risk appraisal; F2: Coping with the temptation to smoke; F3: Stimulus control ; F4: Self-reappraisal; F5: Commitment to change

Factor analysis

The results of the factor analysis for the SCS-CS showed that 18 of the 19 items of the instrument were correctly assigned to the expected factor. As can be seen in Table 2, only Item 5, which should have been included in Factor 2 (Taking control), appeared as part of Factor 1 (Commitment to change).

Regarding the SCS-FS, factor analysis grouped 15 of the 17 items that make up the scale into the expected factors as can be seen in Table 3. Item 6, which we expected to form part of Factor 2 (Coping with the temptation to smoke) appeared as part of Factor 5 (Commitment to change). Item 16, which was expected to load on Factor 5 (Commitment to change), was finally included in Factor 4 (Self-reappraisal).

Gender and self-change strategies

We compared the scores of male smokers (n = 72) and female smokers (n = 116) in the SCS-CS and in the five factors extracted from the scale. The strategies were grouped into cognitive and behavioral strategies. As there were more cognitive strategies, in order to compare them to the behavioral strategies, the groups of strategies were transformed into a linear scale ranging from 1 to 50.

Regarding the total score of SCS-CS, the men obtained a higher mean than the women (46.66 vs. 41.69, SD = 11.43 and 11.99, for men and women, respectively). This difference was statistically significant ($p < .01$). Likewise, we also found statistically significant differences in three of the five factors of the SCS-CS, specifically, in Commitment to change, Risk appraisal, and Coping with the temptation to smoke, always with higher scores in the group of male smokers, as can be seen in Table 4.

No statistically significant differences were observed as a function of gender in the type of strategies most frequently used by the smokers. In both genders, the most frequently used strategies were Commitment to change and Risk appraisal.

Lastly, we found statistically significant differences ($p < .01$) in the means of the scores of the cognitive strategies, where, one again, the men used more often than the women (24.70 vs. 21.46, SD = 6.66 and 6.85, for men and women, respectively). However, no statistically significant differences were found in the use of behavioral strategies, the use of which predominated in both genders in comparison to the cognitive ones.

We also compared the men (n = 100) and the women (n = 80) in the SCS-FS. As in the previous case, we compared the means of the diverse factors of the scale,

Table 4
Differences in Means and Standard Deviations between men and women in the SCS-CS

Variables	Men N = 72	Women N = 116	t (p)
Mean age *(SD)*	30.64 (12.17)	32.93 (12.82)	–1.23 (.22)
Mean *(SD)* total score SCS-CS	46.66 (11.43)	41.69 (11.99)	2.85 (.005)*
Mean *(SD)* Commitment to change	13.31 (4.06)	11.71 (4.00)	2.66 (.008)*
Mean *(SD)* Taking control	7.83 (2.78)	7.41 (2.80)	1.00 (.31)
Mean *(SD)* Risk appraisal	12.46 (4.07)	10.47 (3.94)	3.30 (.001)*
Mean *(SD)* Help from others	7.44 (3.31)	7.36 (3.19)	0.16 (.86)
Mean *(SD)* Coping with temptation to smoke	7.35 (3.15)	6.28 (2.68)	2.39 (.017)*
Mean *(SD)* Cognitive strategies	24.70 (6.66)	21.46 (6.85)	3.22 (.001)*
Mean *(SD)* Behavioral strategies	26.97 (8.04)	25.53 (8.07)	1.19 (.23)

* Statistically significant differences at $p < .05$

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Table 5
Differences in Means and Standard Deviations between men and women in the SCS-FS

Variables	Men $N = 100$	Women $N = 80$	*t (p)*
Mean Age *(SD)*	33.99 (12.34)	40.61 (13.29)	–3.41 (.001)*
Mean *(SD)* total score SCS-FS	49.00 (12.57)	41.06 (12.08)	4.30 (.00)*
Mean *(SD)* Risk appraisal	13.61 (4.30)	10.65 (4.07)	4.72 (.00)*
Mean (DT) coping with temptation to smoke	8.41 (4.27)	6.65 (3.31)	3.11 (.002)*
Mean *(SD)* Stimulus control	8.46 (4.20)	7.40 (3.44)	1.86 (.064)
Mean *(SD)* Self-reappraisal	15.63 (3.66)	14.08 (4.56)	2.47 (.014)*
Mean *(SD)* Commitment to change	11.85 (3.92)	9.94 (3.89)	3.24 (.001)*
Mean *(SD)* Cognitive strategies	33.93 (7.97)	28.20 (8.34)	4.67 (.00)*
Mean *(SD)* Behavioral strategies	17.73 (7.79)	15.05 (6.29)	2.54 (.012)*

* Statistically significant differences at $p < .05$

and of the groups of cognitive and behavioral strategies. The results of these comparisons are displayed in Table 5.

The men scored higher than the women in the total scale ($M = 49$ vs. 41.06, $SD = 12.57$ and 12.08, for men and women, respectively, $p < .01$). We also found statistically significant differences in four of the five factors of the SCS-FS, with the men always scoring higher than the women. The only factor where no statistically significant differences were found was Stimulus control. The groups of most frequently used strategies in both genders were Self-reappraisal and Risk appraisal.

Lastly, we found statistically significant differences ($p < .01$) both in the group of cognitive and behavioral strategies, with higher scores among the men. In both genders, the cognitive strategies were used more frequently than the behavioral ones.

Discussion and Conclusions

The goal of this study was to validate and adapt two scales of self-change strategies, one for smokers (SCS-CS) and one for former smokers (SCS-FS), to the Spanish population, and to begin to address this phenomenon, analyzing the possible differences in these strategies as a function of gender.

In the case of the SCS-CS, both the scale as a whole and four of the five factors obtained alpha values higher than .70. Only the factor Taking control did not fulfill this criterion ($\alpha = .49$). In the SCS-FS, we found similar results, as only one factor (Commitment to change) did not meet the criterion. These results are practically identical to those obtained in the two previous validations in French and English (Christie & Etter, 2005; Etter, Bergman, & Perneger, 2000b). In fact, in the English validation, the factor Commitment to change in former smokers did not meet the minimum alpha value criterion (Christie & Etter, 2005).

With regard to the factor analysis, the results practically reproduce the same structure as in the initial study (Etter, Bergman, & Perneger, 2000b) because most of the items in both scales loaded on their corresponding factors, although some loaded on other factors, as also occurred in the English validation (Christie & Etter, 2005), although the items were not the same ones.

In view of these results, we conclude that both scales have satisfactory psychometric properties and, despite having been validated in a different population, they are accurate replicas of the versions in other languages; therefore, they are useful and validated instruments for Spanish-speaking populations.

The second goal of this study was the analysis of the possible differences between men and women, in both smokers and former smokers, in the use of self-change strategies. In view of the results, we conclude that no differences were found between genders, both in smokers and former smokers in the kind of strategies employed.

The most frequently used change processes by smokers in both genders was Commitment to change and Risk appraisal, which might indicate that these people were at the time of appraisal within the change stages of contemplation and preparation, because of the relation between the change processes and these stages. The same occurred when comparing the use of cognitive and behavioral strategies, because both genders used more behavioral strategies.

In the case of former smokers, the most frequently used change processes were Self-reappraisal, Risk appraisal, and Commitment to change, which are closely related to the action and maintenance stages. In this case, both men and women reported using cognitive strategies more frequently than behavioral strategies.

These findings indicate, as in previous works (Etter et al., 2002), that the psychological mechanisms that predominate the control of the smoking habit are the same in men and women and that, therefore, the orientation of the interventions does not need to be substantially different

as a function of gender, at least insofar as concerns the processes and strategies that are presented in treatments of addiction to nicotine.

However, if we take into account the quantity of strategies used by men and women, the differences in this study were notable. In general, the men employed more strategies and scored higher than the women in all the factors, both in the case of the smokers and the former smokers. These data may make more sense if we take into account the results of many studies that indicate that the relapse rates are usually higher in women than in men (Bjornson et al., 1995; Perkins, 2001; Royce, Corbett, Sorensen, & Ockene, 1997; Schnoll, Patterson, & Lerman, 2007; Ward, Klesges, Zbikowski, Bliss, & Garvey, 1997). The fact that men have a larger repertory and use more self-change strategies may make them more resistant to relapses. Women might need more intensive specific training to increase their coping strategies in situations of risk of consumption. Problems with coping strategies have been also related with impulsive behaviors like binge eating (Sierra Baigrie & Lemos Giráldez, 2008) and with other psychological disorders (Palomar Lever, 2008).

The design of this study does not allow explaining why men use more self-change strategies, therefore, new works are needed to analyze other variables that might explain these differences. It might be useful to include variables related to nicotine addiction and its recovery. It would also be suitable to carry out new studies with prospective follow-ups of smokers. In the case of the former smokers, it would also be useful to assess them at different times in order to analyze the test-retest reliability of the scales. It would also be appropriate to use a larger sample of men and women in order to increase sample representativeness and, thus, the possibilities of generalizing the results.

Lastly, the method to recruiting the participants may have biased the data obtained because some works have shown differences when comparing recruitment methods in which the participants volunteered (i.e., ads in the newspapers) and studies based on surveys of the general population (Etter & Perneger, 2001; Hughes, Giovino, Klevens, & Fiore, 1997). It seems that the smokers who volunteer tend to exaggerate their previous and current consumption habits compared to those recruited from the general population. With regard to this point, some studies (Erickson, 1979; Heckathorn, 1997, 2002) have described some limitations of the snowball technique that could also affect our study. Firstly, the bias that can occur due to the inferences of the initial participants— who were in charge of selecting the next participants—and their viewpoint of who might fit in the study. We think this potential bias did not affect our study because the people who administered the instruments were provided with clearly defined inclusion criteria, and they had been appropriately trained to perform the tasks. Secondly, the selection of the participants could be affected by the size of the recruiters' social network. Lastly, the sample was not a truly random sample, but rather a probabilistic or intentional sample. Nevertheless, this sampling technique is habitual and accepted in social sciences, especially when there is no defined sampling framework.

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