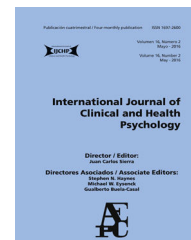




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ORIGINAL ARTICLE

Humor as a protective factor against anxiety and depression

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KEYWORDS

Humor;
Anxiety;
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Ex post facto study.

Abstract

Background/Objectives: Even though humor its part of everyday life, only in the last 40 years has Psychology begun to discern its impact on mental health. The aim of this paper is to explore the role that humor styles may have as protectors against anxiety and depression and their relationship with optimism.

Method: A sample of 804 participants ($M = 39.28$; $SD = 14.71$) was used to analyze the uses of humor, optimism and clinical symptoms of anxiety and depression. In addition, the influence of sociodemographic variables such as sex, geographic location, age and educational level on different uses of humor was studied. Through an analysis of structural equations, the variables that had a protective or facilitating role in depression and anxiety were analyzed.

Results: Men and women differ in the use of a more aggressive humor style, and the use of affiliative humor styles decreases with age. The structural equation model indicated a good fit to the proposed theoretical model.

Conclusions: Humor is a tool of everyday life and it can act for or against an individual's mental health.

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PALABRAS CLAVE

Humor;
ansiedad;
depresión;
optimismo;
Estudio ex post facto.

El humor como factor protector de la ansiedad y la depresión

Resumen

Antecedentes/Objetivos: Si bien el humor es algo que forma parte de la vida cotidiana, en los últimos 40 años la Psicología ha empezado a discernir su impacto en la salud mental. El objetivo de este estudio explora el papel que los tipos de humor pueden tener como protectores de la ansiedad y la depresión y su relación con el optimismo.

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Método: Se empleó una muestra de 804 participantes ($M = 39.28$; $DT = 14.71$) para analizar los usos del humor, el optimismo y los síntomas clínicos de ansiedad y depresión. Además, se estudió la influencia de variables sociodemográficas como el sexo, la ubicación geográfica, la edad y el nivel de estudios en los diferentes usos del humor. A través de un análisis de ecuaciones estructurales, se analizó qué variables poseían un papel protector o facilitador en la depresión y en la ansiedad.

Resultados: Los hombres y las mujeres difieren en el uso de un humor más agresivo y el uso del humor afiliativo disminuye con la edad. El modelo de ecuaciones estructurales mostró un buen ajuste al modelo teórico propuesto.

Conclusiones: El humor es una herramienta de la vida cotidiana y puede actuar a favor o en contra de la salud mental del individuo.

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In the last 40 years, the attention that the scientific community pays to humor has grown following the discovery of its impact on mental health (Bennett & Lengacher, 2006; Calisandemir & Tagay, 2015; Martin et al., 2003). Various studies have concluded humor to be a viable strategy for coping with stressful or traumatic life events (Abel, 2002; Abel & Maxwell, 2002; Calisandemir & Tagay, 2015; Cann et al., 2010). However, there is no satisfactory consensus when it comes to defining humor. The most widely accepted definition so far is from Martin (2007), who described humor as a multidimensional construct that brought together behavioral habits (comic commentary), ability (understanding jokes) and a coping strategy (in stressful situations). They also recognized the possibility of dividing humor into four components: social context, a cognitive-perceptual process, an emotional response and the verbal expression of laughter. However, this definition made operationalizing the construct more difficult. Thus, Martin et al. (2003) suggested studying humor according to the use that is made of it. Fig. 1, based on Ruch and Heintz (2015), represents those uses. On the left are humors targeted at others; affiliative humor is making jokes and telling funny stories to others, aggressive humor is making fun of others. On the right is humor towards oneself; self-enhancing humor to cope with situations bet-

ter, and self-defeating humor is being detrimental to oneself to gain the appreciation of others. The upper boxes are positive, the lower ones, negative, as defined in previous research (Martin et al., 2003).

Various studies have looked at the relationship between the uses of humor, anxiety, depression and optimism. During the development of the Humor Styles Questionnaire (HSQ), Martin et al. (2003) used different samples to identify correlations between the uses of humor and those variables, among many others. They found that depression was negatively correlated with positive uses of humor, but positively correlated with self-defeating humor. They found similar results for anxiety. In addition, they found positive correlations between self-enhancing humor and optimism. Dyck and Holtzman (2013) discovered that the use of humor determined the appearance of depressive symptoms, depending on the perception of support from one's social circle. This perception depended on the subjects' sex; women were perceived as more hostile when they used aggressive humor. Rnic, Dozois, and Martin (2016) looked for connections between distorted thinking, the uses of humor, and depressive symptoms. They found significant correlations between the appearance of depressive symptoms and aggressive, self-defeating and self-enhancing uses of humor, the first two correlations were positive, the latter was negative. Edwards and Martin (2010) wondered whether those who were more likely to use humor were more psychologically resilient. They found that better psychological wellbeing was not related to being funny in specific instances, but rather the predominant use of humor in everyday life.

A meta-analysis by Schneider, Voracek, and Tran (2018) found significant correlations between the uses of humor and anxiety, depression and optimism. Positive uses were positively correlated with optimism, and negatively correlated with depression and anxiety. Self-defeating humor exhibited the opposite pattern (aggressive humor did not show any influence). Other research has found similar relationships between humor, depression, anxiety and optimism (Besser, Luyten, & Blatt, 2011; Frewen, Brinker, Martin, & Dozois, 2011; Jovanovic, 2011; Kuiper, Grimshaw, Leite, & Kirsh, 2006). Given all that, one might suggest that high scores

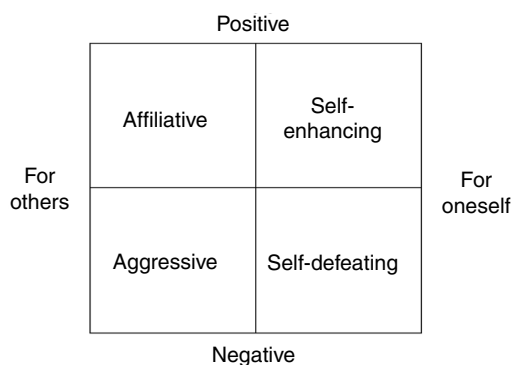


Fig. 1 Model of the uses of humor.

Note. The numbers in the arrow-lines are the weightings of the variables

in optimism, understood as a positive view of future events, together with positive uses of humor, will be protective factors in anxiety and depression.

This study examines the influence of humor on mental health. We specifically analyze the relationship between anxiety, depression and optimism and the uses of humor. We look at whether there are differences in the use of humor depending on sex, age, location and education. Finally, we propose a mathematical model, via structural equations, which explains the relationship between humor, optimism, depression and anxiety. Our secondary goal is to assess the reliability of all of the instruments used and to examine the reliability of the HSQ in a Spanish population, as well as evidence of its validity, dimensionality, and convergent and divergent validity.

Although other research has examined the relationship between humor, anxiety, depression and optimism, few studies have worked with Spanish samples, or gone into detail about differences related to sex, age, location or education. In this way, our research offers a better understanding of the Spanish population and the use of humor that predominates in relation to the aforementioned sociodemographic variables. Similarly, the mathematical model we propose will allow a better understanding of the dynamic between humor, optimism, anxiety and depression, and allow us to see whether the use of humor is truly a protective factor in mental health.

Method

Participants

The sample was made up of 804 participants (65.4% women) who were Spanish nationals, aged between 18 and 76 years old (mean age 39.28, $SD = 14.71$). The sampling was a "snowball" method. Table 1 gives the full description of the sample for better understanding. The groups were used to study the differences in terms of education, location and age.

Instruments

The Humor Style Questionnaire (HSQ; Martin et al., 2003). We used the adaptation for the Spanish population by Torres-Marín, Navarro-Carrillo, and Carretero-Dios (2018). This adapted version has 32 items grouped into four dimensions referring to the habitual use of humor: (a) Affiliative humor, with $\alpha = .81$ (e.g., "I enjoy making people laugh"), defined as the use of humor aimed at making friends and maintaining friendships; (b) Self-enhancing humor with $\alpha = .82$ (e.g., "If I feel depressed, I can generally improve my mood using humor"), defined as the use of humor to positively deal with stressful conflicts; (c) Aggressive humor, with $\alpha = .68$ (e.g., "If someone makes a mistake, I normally make fun of them for it"), defined as the use of humor to put other people down; and (d) Self-defeating humor, with $\alpha = .75$ (e.g., "I let others laugh at me or enjoy themselves at my expense more than I should"), defined as the use of humor to present oneself as comically inferior. Each dimension has eight 7-point Likert-type response scales.

Table 1 Description of the sample, by education, geographical location, and age.

Variable	Variable groups	Percentage
Educational attainment	Obligatory Education	9.1%
	Further Secondary Education	25.5%
	University degree	50%
	Vocational training	15.3%
Geographical region	North	58.2%
	West	10.2%
	East	3.9%
	South	11.3%
	Center	16.4%
Age ^a	18-25	25.4%
	26-40	26.4%
	41-55	34.1%
	>55	14.2%

Note. North: Asturias, Cantabria, Basque Country, Navarra; West: Extremadura, Galicia; East: Catalonia, Valencia, Murcia, Balearic Islands; South: Ceuta, Melilla, Canary Islands, Andalucía; Center: Castilla-La Mancha, Castilla-León, Madrid, La Rioja; ^a: The cut-off points were set using intervals indicated by García-Madruga (2010).

The Educational-clinical Questionnaire of Anxiety and Depression (CECAD; Lozano, García-Cueto, & Lozano, 2010). This is a self-report with 50 Likert-type items split into two dimensions: (a) Depression with $\alpha = .95$, defined as a disturbed state of mood characterized by a dysphoric state; and (b) Anxiety, with $\alpha = .90$, defined by psychophysiological symptoms (tachycardia, nausea, muscular tension...). Ten items from each scale with the best discrimination indexes were selected in order to have a shorter test to measure both anxiety and depression while maintaining good accuracy.

The Optimism Questionnaire (COP; Pedrosa, Celis-Atenas, Suarez-Álvarez, García-Cueto, & Muñiz (2015). A self-report with a reliability of $\alpha = .84$, containing 15 Likert-type items, in which optimism is defined as "a tendency to positively evaluate the occurrence of future events (possible or not)".

All of the instruments included a form with 5 Likert-type response alternatives, from 1 (*Completely disagree*) to 5 (*Completely agree*).

Procedure

The application of the instruments was done through the creation of a form in Google Forms. All of the scales were included, with items distributed randomly although with the restriction that no item would measure the same dimension as the item preceding it. Following that, the form was distributed, following a snowball procedure, using various social networks. In addition, we made contact with vocational training centers in order to reach participants who

Table 2 Reliability of the instruments.

Scales	McDonald's Omega
Affiliative humor	.86
Self-enhancing humor	.82
Aggressive humor	.79
Self-defeating humor	.80
COP (optimism)	.94
CECAD Anxiety scale	.87
CECAD Depression scale	.92

Note. COP: Optimism Questionnaire; CECAD: Educational-clinical Questionnaire of Anxiety and Depression.

were outside the university, and we sent the form to volunteer students who were over 18, asking them to also send it to anyone who might be interested. Information cards were also left in adult education centers with a link to the test battery for anyone interested in participating. The University of Oviedo Ethics Committee followed and approved each step of the study.

Statistical analysis

To estimate the reliability of each scale, we used the Ω coefficient (McDonald, 1999) because of its independence from the number of items and its superior stability compared to the α coefficient (Ventura-León & Caycho-Rodríguez 2017). To find new evidence for the instrument's factorial validity, we performed a confirmatory factor analysis (Muñiz & Fonseca-Pedrero, 2019), using two indexes of fit to confirm a good fit to the data (Kline, 2011): The CFI, which should be over .90, and RMSEA, which should be below .08, although values below .10 are equally valid (Hoyle, 2012). We used the AVE index to look at convergent and divergent validity (Fornell & Larcker, 1981; Hair et al., 2009). An AVE for the scale that is greater than .50 confirms convergent validity, and divergent validity is confirmed if all of the squares of the correlations between the scales are lower than the AVE indexes for each scale. Evidence of validity with other variables was provided using the Pearson correlation.

In order to identify significant differences in uses of humor in terms of sex, age, education and location, we carried out the Shapiro-Wilks goodness of fit test, as that was the most suitable for the sample in our study (Pedrosa, Juarros-Basterretxea, Robles-Fernández, Basteiro, & García-Cueto, 2015). Because the assumption of normality was not satisfied, we continued with the non-parametric Mann-Whitney *U* test for the variable sex, and Kruskal-Wallis *H* for the other variables. In both tests, Cohen's *d* was used to calculate the effect size (Lenhard & Lenhard, 2016). Finally, to examine the interaction between the uses of humor, optimism, anxiety and depression, we used path-analysis, following the same criteria of fit as in the confirmatory factor analysis.

Results

Firstly, we examined the reliability of the instruments. The results are given in Table 2. Most demonstrated appropriate reliability ($\geq .80$), with the lowest being .79.

Table 3 Correlations between uses of humor, anxiety, depression and optimism.

	Depression	Anxiety	Optimism
Affiliative humor	-.28**	-.21**	.31**
Self-enhancing humor	-.36**	-.20**	.53**
Aggressive humor	.13**	.06	-.16**
Self-defeating humor	.36**	.29**	-.17**

Note. ** $p < .01$.

Table 4 Correlations between the uses of humor.

	1	2	3	4
1. Affiliative humor		.47**	.07*	.19**
2. Self-enhancing humor			.04	.18**
3. Aggressive humor				.29**
4. Self-defeating humor				

Note. ** $p < .01$, * $p < .05$.

Table 5 Divergent and convergent validity of the HSQ.

	AVE	1	2	3	4
1. Affiliative humor	.44		.22	.00	.03
2. Self-enhancing humor	.36			.00	.03
3. Aggressive humor	.32				.08
4. Self-defeating humor	.35				

Note. AVE: Average Variance Extracted; HSQ: Humor Styles Questionnaire.

The results of the confirmatory factor analysis show a good fit (CFI = .912; RMSEA = .083). The correlations between the scales are given in Table 3. As expected, positive uses of humor (affiliative and self-enhancing) are positively correlated with optimism and negatively correlated with anxiety and depression, demonstrating a protective role. The opposite is found with negative uses of humor (aggressive and self-defeating), which act as risk factors.

Table 4 shows the matrix of correlations between the scales of humor in the HSQ. The most surprising correlation is the positive association between the use of self-defeating humor and the positive uses of humor.

Table 5 shows the AVE indexes for each scale and the squares of their correlations for the determination of convergent and divergent validity. None of the HSQ scales produced an AVE index greater than .50, which puts divergent validity in doubt. All of the squares of the correlations are well below the individual AVE indexes, which confirms divergent validity.

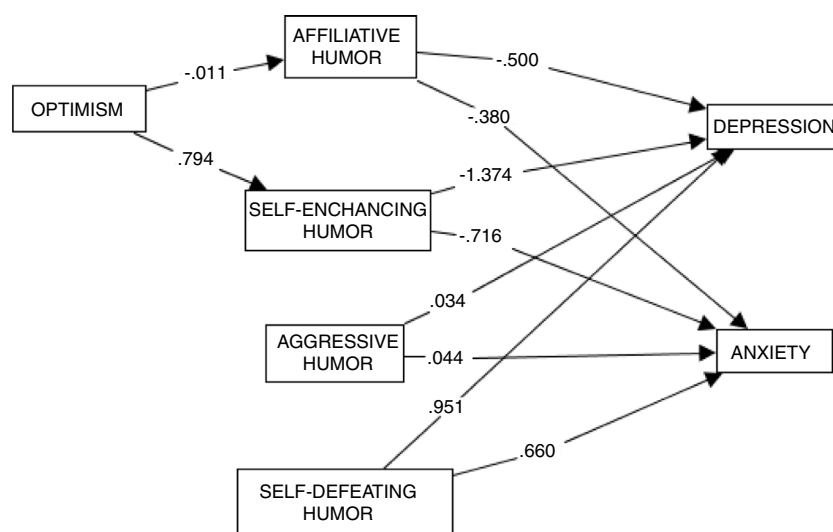
Before the MANOVA, we carried out the Shapiro-Wilks test to confirm the supposition of normality. For all of the HSQ scales, the null hypothesis was rejected ($\alpha = .05$), normality could not be confirmed. Table 6 gives the results of the non-parametric significance test, the effect size and the mean score for each sex. Men scored significantly higher than women in the use of aggressive humor, with a moderate effect size.

Table 7 gives the results of the non-parametric significance test, and the effect size for the variables location, age and education.

Table 7 Kruskal-Wallis' *H* and Cohen's *d* for the variables location, age and education.

	Mean	Location			Age			Education		
		<i>H</i>	<i>p</i>	<i>d</i>	<i>H</i>	<i>p</i>	<i>d</i>	<i>H</i>	<i>p</i>	<i>d</i>
Affiliative humor	30.28	7.5	.11	0.13	58.5	<.001	0.55	21.4	<.001	0.30
Self-enhancing humor	26.02	1	.90	0.13	14.2	.003	0.23	6.1	.10	0.13
Aggressive humor	18.21	5	.28	0.07	14.7	.002	0.02	15.3	.002	0.25
Self-defeating humor	19.45	2.9	.57	0.07	3.2	.35	0.03	11.3	.01	0.20

Nota. *H*: Kruskal-Wallis' *H*.

**Fig. 2** Diagram of the path-analysis model.**Table 6** Mean, Mann-Whitney *U* test and Cohen's *d* for the variable sex.

	Mean*		<i>p</i>	<i>d</i>
	Men	Women		
Affiliative humor	31.4	29.7	<.001	0.28
Self-enhancing humor	26.9	25.6	.005	0.20
Aggressive humor	20.1	17.2	<.001	0.52
Self-defeating humor	20.26	19	.002	0.22

Note. *The maximum possible score is 40.

In the path-analysis, the fit of the model was good (CFI = .993; RMSEA = .053). The model is shown in Fig. 2 with the weightings for each relationship. The negative weightings in anxiety and depression are protective factors, the positive weightings are risk factors.

Discussion

The main objective of our study was to examine the influence of humor on people's mental health. We looked at the differences in the uses of humor depending on sex, age, geographical location and educational attainment. This research also provides new evidence of the validity and reliability of the HSQ, as well as its factorial structure, in a Spanish population. Although the objectives were very

similar to previous research, the mathematical path-analysis model is novel.

The values for reliability from each of the HSQ scales were acceptable, and most were greater than .80, with the lowest being .79). These results improve on the reliability found in previous studies (Martin et al., 2003; Torres-Marín et al., 2018).

The factorial structure of the HSQ exhibited an acceptable fit (CFI = .912; RMSEA = .083). In addition, at least two of the indicators were sufficient to demonstrate a good fit of the data to the model (Kline, 2011). Convergent validity tests did not produce satisfactory values (the AVE indexes were below .50), but divergent validity was adequate (the AVE indexes were always higher than the squares of the correlations). The correlation matrix showed that the uses of humor followed a pattern that was expected based on previous research (Besser et al., 2011; Edwards & Martin, 2010; Frewen et al., 2008; Jovanovic, 2011; Kuiper et al., 2006; Martin et al., 2003; Rnic et al., 2016; Torres-Marín et al., 2018): affiliative and self-enhancing uses of humor were positively related with optimism and negatively related with anxiety and depression. Aggressive and self-defeating uses of humor exhibited the opposite relationships. The results continue to support the distinction between positive and negative uses of humor.

It is interesting how the correlations between the HSQ scales, shown in Table 4, indicate positive correlations between the self-defeating use of humor and the

positive uses (.19 with affiliative and .18 with self-enhancing). [Torres-Marín et al. \(2018\)](#) also found these correlations and hypothesized that in Spain there was a different cultural idea of the use of self-defeating humor, and therefore it was more widespread and more accepted. They called for more research in the Spanish population in order to have more robust conclusions. Nonetheless, the self-defeating use of humor is still negatively correlated with anxiety and depression, and is still considered a negative use of humor. As in our study, they found a positive correlation between the aggressive use of humor and the affiliative use. [Dyck and Holtzman \(2013\)](#) also found this relationship, such that aggressive use of humor corresponded to better perceptions of social support. While in their results this was seen more in men than women, the large numbers of women in our study compared to men shows that aggressive uses of humor are more prevalent in the Spanish female population than in the Canadian. [Martin et al. \(2003\)](#) proposed another explanation. After finding a positive relationship between affiliative and aggressive uses, in both men and women, they argued that the two uses shared inseparable factors. This may explain the positive correlation between self-enhancing and aggressive uses. These results, along with prior research, points towards aggressive humor as a construct with consequences that are sometimes positive and sometimes negative ([Cassaretto & Martinez, 2009](#); [Edwards & Martin, 2010](#); [Schneider et al., 2018](#); [Stanley, Lohani, & Isaacowitz, 2014](#); [Torres-Marín et al., 2018](#)).

We examined the differences in the uses of humor depending on sex, age, location and education using non-parametric tests. A person's sex determined what type of humor they would use (affiliative, aggressive or self-defeating). For affiliative and self-defeating, this was not so important (the effect size was small), but it was a determinant in the aggressive use of humor (the effect size was moderate). This notable result is in line with previous research ([Dyck & Holtzman, 2013](#); [Martin et al., 2003](#); [Torres-Marín et al., 2018](#)) and fits with the social perspective, in which men use much more defamatory humor, whether harmful or friendly.

The age of the subjects was important in the affiliative use of humor (the effect size was moderate), while it was less important in the self-enhancing or aggressive uses (the effect size was small). The trend was that the older someone is, the less they employ affiliative uses of humor. Given the peculiarities of the Spanish sample compared to English-speaking samples, which have been predominant in prior studies, it would be useful to further examine this use of humor throughout the lives of people living in Spain. It is worth stressing that the self-defeating use of humor was not significantly different between the different age groups. This may be due to the fact that, in Spain, self-defeating humor is so widespread that there are no intergenerational differences. The role of education in the greater affiliative, aggressive and self-defeating uses of humor was small (the effect size was small), and geographical location seemed to make no difference to the types of humor used.

Our proposed model had a good fit, with a CFI much greater than .90 (CFI = .993) and RMSEA much lower than .08 (RMSEA = .053). Two of the indicators of fit also exhibited suitable values ([Kline, 2011](#)). As shown in [Fig. 2](#), positive uses of humor (affiliative and self-enhancing) act as protective

factors against the appearance of symptoms of depression and anxiety. However, negative uses of humor act as risk factors. This can also be seen in [Table 3](#), where positive uses are negatively correlated with anxiety and depression, while negative uses are positively correlated. The opposite happens with optimism. Thus, an optimist will be a much more habitual user of positive humor than negative, and according to the proposed model, will be particularly protected against anxiety and depression. However, two things are notable. The weight of aggressive uses of humor as a risk factor for depression and anxiety is low; this can be seen in [Table 3](#), where the value is positive, but low. As we said above, the construct of aggressive use of humor is mixed, at times results indicate it is negative, at other times its impact is minute, or positive. As this is a new model, the results may serve as something to bear in mind when trying to understand aggressive humor. We would recommend continued study of the complexity of humor as an aggressive element, because as we have seen, at times it is affiliative, and at times destructive. The other aspect to consider is the negative relationship between affiliative humor and optimism. Although it might seem paradoxical, this negative relationship with optimism does not particularly affect the function of affiliative uses of humor as a protective factor against anxiety (-.38) and depression (-.50), although it does reduce it slightly. Given that the effect of optimism on affiliative humor is carried over to the relationship between it and depression and anxiety, we can conclude that the use of this type of humor by optimistic people is still particularly protective against the appearance of anxiety or depressive symptoms.

If we look at the indexes of fit for the model, it can be considered viable, both for subsequent research and for the clinical conceptualization of humor. Measuring a person's predominant uses of humor may provide a view of factors which foster psychopathological symptoms. A patient with depression may score highly in self-defeating uses of humor, which would indicate to their therapist a way for their client to face adaptation to their surroundings (via the use of more affiliative, anecdotal humor rather than focusing on one's negative qualities). This training is feasible, even using online platforms, as shown by [Baisley and Grunberg \(2019\)](#). The positive use of humor may also be a factor that could separate someone with depression from suicidal ideation by strengthening their mental health. This preventive aspect of positive mental health against suicidal outlooks and planning was seen in [Teismann et al. \(2018\)](#).

This study contributes to the understanding of humor and the role it plays as another element in mental health. One may envisage how training in a different use of humor may be beneficial. In fact, authors such as [Tagalidou, Loderer, Distlberger, and Laireiter \(2018\)](#), with a sub-clinical sample (with marked symptoms of depression or anxiety), and [Cai, Yu, Rong, and Zhong \(2014\)](#), with patients with schizophrenia, have demonstrated that humor training promotes resistance to stress. This training could also form part of already-defined programs teaching social skills, such as that used in [Oliveres-Oliveres, Ortiz-González, and Oliveres \(2019\)](#), owing to the positive effects of affiliative and self-enhancing uses of humor. However, future research should not only focus on those cases with already-consolidated problems, but also on the role of humor as a protective fac-

tor. For example, one might examine what type of humor predominates in those whose lives have been marked by serious events, but who demonstrate resilience and good adjustment. The presence of humor as a coping strategy in such groups has been studied by Chahraoui, Laurent, Bioy, and Quenot (2015), Hernández-Varas, Labrador Encinas, and Méndez Suárez (2019), Langdon & Sawang (2018), and López-Fuentes & Calvete (2015), but not thoroughly. Finally, our results underline the peculiarity of the Spanish sample compared to English-speakers, and for this reason it would be interesting to continue the research towards a more exhaustive study comparing the two, and the complexion of Spanish humor following the classification we used in this study.

One of the limitations of this study is the imbalance between the most significant groups. In addition, the convergent validity demonstrated by the HSQ in this study was poor. This result, along with results from other studies (Heintz & Ruch, 2015; Ruch & Heintz, 2013) underscores the need to re-evaluate the psychometric properties of this questionnaire.

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