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Article

## Interpretation Biases in Social Scenarios and Social Anxiety: The Role of Safety Behaviors

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### ABSTRACT

**Background:** Interpretation bias (IB) and safety behaviors (SB) are maintenance mechanisms of social anxiety (SA). However, few studies have examined the role of IB and SB together in explaining SA. The objective of this study was to determine whether SB explains the association between IB and SA. To evaluate these variables, the Adolescents' Interpretation and Beliefs Questionnaire (AIBQ 2.0) and the Social Phobia Safety Behaviors Scale (SPSBS) needed to be adapted for Spanish adolescents and young people. **Method:** 826 Spanish vocational training students (60% males, 14–28 years old) completed a measure of SA and the AIBQ 2.0 and SPSBS. **Results:** Path analysis showed that IB in offline scenarios was associated with SA through SB. IB in offline situations, but not in online situations, was directly associated with SA. As expected, the AIBQ 2.0 showed a two-dimensional structure and good internal consistency. The SPSBS demonstrated a unidimensional structure and good internal consistency. **Conclusions:** In the absence of longitudinal studies, the data are compatible with the possible mediating role of SB in the association between IB and SA. Both instruments (AIBQ 2.0 and SPSBS) exhibited good psychometric properties for Spanish students

## Sesgos de Interpretación en Escenarios Sociales y Ansiedad Social: el Rol de las Conductas de Seguridad

### RESUMEN

**Antecedentes:** Aun considerándose los sesgos de interpretación (IB) y las conductas de seguridad (SB) mecanismos mantenedores de la ansiedad social (SA), son escasos los estudios que examinan estas variables en conjunto. El objetivo del estudio fue evaluar si las SB explican la asociación entre IB y la SA. Para evaluar estas variables se requirió adaptar el Adolescents' Interpretation and the Beliefs Questionnaire (AIBQ 2.0) y el Social Phobia Safety Behaviors Scale (SPSBS) en adolescentes y jóvenes españoles. **Método:** 826 estudiantes españoles de formación profesional (60% hombres, 14-28 años) completaron una medida de SA y el AIBQ 2.0 y SPSBS. **Resultados:** El path analysis mostró que las IB en escenarios offline se asociaron con SA a través de SB. Las IB en situaciones offline, pero no online, se asociaron directamente con SA. El AIBQ 2.0 mostró una estructura de dos dimensiones y consistencia interna aceptable. El SPSBS mostró una estructura unidimensional y buena consistencia interna. **Conclusiones:** A falta de estudios longitudinales, los datos son compatibles con el posible rol mediador de las SB respecto a la relación entre IB y SA. Ambos instrumentos (AIBQ 2.0 y SPSBS) disponen de buenas propiedades psicométricas en estudiantes españoles.

#### Palabras clave:

Ansiedad social  
Sesgos de interpretación  
Conductas de seguridad  
Propiedades psicométricas

Self-reported prevalence rates of social anxiety (SA) in Spanish adolescents are about 12% (Inglés et al., 2008) and it is more frequent in women (Inglés et al., 2010). Cognitive-behavioral models propose that SA is maintained by at least two processes: the negative interpretation of ambiguous social situations and safety behaviors (SB) (Amir et al., 1998; Coles et al., 2008). According to these models, the tendency toward the negative interpretation of social situations, or interpretation bias (IB), is a process that occurs during a social situation and that precedes the manifestation of anxious symptoms (Clark & Wells, 1995). For example, IB occurs when an adolescent interprets a group of people whispering as if they were talking negatively about them. Likewise, in a social situation interpreted as threatening, people with SA initiate SB to reduce both the symptoms and the possibility of negative evaluation by others (Clark & Wells, 1995; Piccirillo et al., 2016).

IB has primarily been assessed using two different approaches. The first approach is the interpretation of ambiguous faces (Gutiérrez-García et al., 2019; Maoz et al., 2016). The second approach, the most widespread, uses ambiguous social scenarios to assess the interpretations. Usually, some alternative interpretations of the scenario (one negative, one positive, and one neutral) are presented to the participant, who has to evaluate the probability of each interpretation popping into their mind. For example, Miers and colleagues (2008) employed the Adolescents' Interpretation and Beliefs Questionnaire (AIBQ) to measure negative interpretations of social scenarios. They found that adolescents with high SA interpreted ambiguous scenarios more negatively than adolescents with average SA. Other studies also showed similar results (Halldorsson & Creswell, 2017; Leigh & Clark, 2018). Recently, the authors of the AIBQ developed a new version that included online scenarios (AIBQ 2.0; Miers et al., 2020). They found that IB in online scenarios was also associated with SA. Other studies found similar results in online scenarios with undergraduate samples (Carruthers et al., 2019; Kingsbury & Coplan, 2016).

SBs have been described as a dysfunctional emotional regulation strategy and include behaviors such as avoiding looking the speaker in the eye or avoiding attracting others' attention (Helbig-Lang & Petermann, 2010). Through different life stages, SBs occur largely in people with higher SA levels (Kocovski et al., 2016; McManus et al., 2008; Thomas et al., 2015). The use of SBs also has consequences on communication because adolescents and young adults who use SBs to a greater extent tend to be perceived by others as more anxious and with a poorer or less desirable performance when speaking in public (Langer & Rodebaugh, 2013; Plasencia et al., 2011).

Clark and Wells' (1995) model proposes that SBs are initiated after having interpreted risk in a social situation. IB would facilitate the interpretation of ambiguous social cues as negative and, therefore, it would play a relevant role in judging the risk involved in different social situations. Thus, it could be hypothesized that SBs play a mediating role between IB and SA: a higher tendency to negative interpretations in a social context could be associated with a more significant number of SBs, and these, consequently, with more symptoms of SA. The current study will test the hypothesis that the association between IB and SA is (partly) explained by SBs. Analyzing this indirect association is relevant both for the theoretical and clinical context. For example, interventions could be modified to reduce IB and SBs together.

Partial support for the explanatory role of SBs in the relation between SA and cognitive processes comes from a longitudinal study in adult samples with SA disorder (Moscovitch et al., 2013). The study demonstrated that, in a speech task, SB explained the relationship between self-portrayal—self-attributes that one considers deficient and thinks will be exposed to others' evaluation—and negative affect. There was also a direct association between both self-portrayal and negative affect. Thus, the study demonstrates that thinking that others will evaluate one's self-attributes increases the use of SBs in a speech task, and the employment of SBs produces higher levels of negative affect.

Most studies investigating IB and SA have focused on offline or face-to-face social contexts. There is little research on the cognitive processes that occur in online situations (e.g., on social networks like Facebook or Instagram, in chat groups with peers, or dating apps), despite the increasing importance that these situations have in the lives of adolescents and young people (Odgers & Jensen, 2020). Furthermore, compared with offline contexts, in online context people with high levels of SA tend to experience fewer negative social cognitions and prefer online communication (Hutchins et al., 2021). Regarding the use of the Internet for social interactions, the communicative style that takes place through the Internet (online situations) is notably different from the face-to-face style. For example, the lack of nonverbal cues in text-based communications can develop more ambiguity (Riordan & Kreuz, 2010). Therefore, a study of the online situations is important from a theoretical and clinical perspective, for instance, to determine whether the cognitive processes play a similar role in this type of situation and, consequently, whether a different design of interventions is needed.

This study's main objective is to examine whether SBs explain the association between offline and online IB and SA in a sample of Spanish adolescents and young people. Specifically, vocational training students were chosen for this study. The challenge-based learning methodology of vocational centers involves working predominantly in teams and implies different stressful situations, such as oral presentations. We expected SBs to explain at least part of the association between IB in offline scenarios and SA. Online IB was included in an exploratory way under the hypothesis that it would covary with offline IB but not with SA and SBs. This hypothesis was based on Miers et al. (2020), who found that offline IB, but not online IB, indirectly explained the relationship between SA and avoidance in offline situations. Moreover, the literature indicates the existence of sex (Jalnapurkar et al., 2018) and age (Caballo et al., 2014) differences in SA. Thus, the effect of these two variables was controlled for in the analysis.

Given that there is no instrument in Spanish to assess SBs and IB in ambiguous social scenarios, the study's second objective was to translate the AIBQ.2.0 (Miers et al., 2020) and the Social Phobia Safety Behaviors Scale (SPSBS; Pinto-Gouveia et al., 2003) into Spanish and to investigate their psychometric properties. The AIBQ 2.0 was chosen to measure IB in ambiguous social scenarios because it has good psychometric properties and includes both offline and online scenarios (Miers et al., 2020). The AIBQ 2.0 has been shown to present a two-dimensional structure. Therefore, we also expected to find a two-dimensional structure. The SPSBS was chosen to assess SBs because this instrument was developed and validated in a similar language and culture (Portugal) to Spain's, and it has good psychometrical properties (Burato et al., 2009; Pinto-Gouveia et al.,

2003). Although some authors have suggested a two-dimensional structure for the SPSBS (Kocovski et al., 2016), overall research has supported a one-dimensional structure (Burato et al., 2009; Pinto-Gouveia et al., 2003). Thus, in this study, we expected to find a one-dimensional structure. We also expected to find data on the validity of both scales when examining associations with SA levels.

## Method

### Participants

Eight hundred twenty-six students from nine vocational training centers (five concerted and four public) from Bizkaia province of Spain participated. Forty percent were females with an average age of 20.47 years ( $SD = 4.21$ ). The mean age in the male sample was 19.75 years ( $SD = 3.47$ ). The age of participants ranged between 14 and 28 years. No sex differences were found in the different age ranges,  $\chi^2(5) = 5.64$ ,  $p = .34$ . Vocational training studies in Spain last for two years and are divided into three levels: primary grade, intermediate grade, and higher grade. The percentages of participants in the different training levels were 2.5%, 50.6%, and 46.9%, respectively.

Concerning sample size, using an effect-size-based sample estimation (Soper, 2022) with a medium effect size, 200 participants were needed for the exploratory structural equation modeling (ESEM) and 700 for the path analysis model. Thus, the sample size was sufficient for the proposed analyses. However, because the estimation of the sample was based on an analysis for a larger study, the sample is higher than the recommendations.

The educational level of the parents follows these distributions: 3.8% without education, 4.9% primary school, 31.6% high school, 28.7% vocational training, and 31.1% university studies. The distribution of the parents' professions, according to the criteria of the National Institute of Statistics of Spain, was as follows: restaurant and security service workers and salespeople (32.2%), scientific and intellectual professionals (17.9%), artisans and skilled workers in the manufacturing and construction industries (17.2%), technicians and support professionals (7.6%), accounting and administrative employees (7.4.5%), homemakers (2%), directors and managers (1.9%), elementary occupations (7%), machinery operators (4%), pensioners (1.5%), skilled workers in the agricultural, livestock, forestry, and fishing sectors (0.9%), unemployed (0.3%), and military personnel (0.1%).

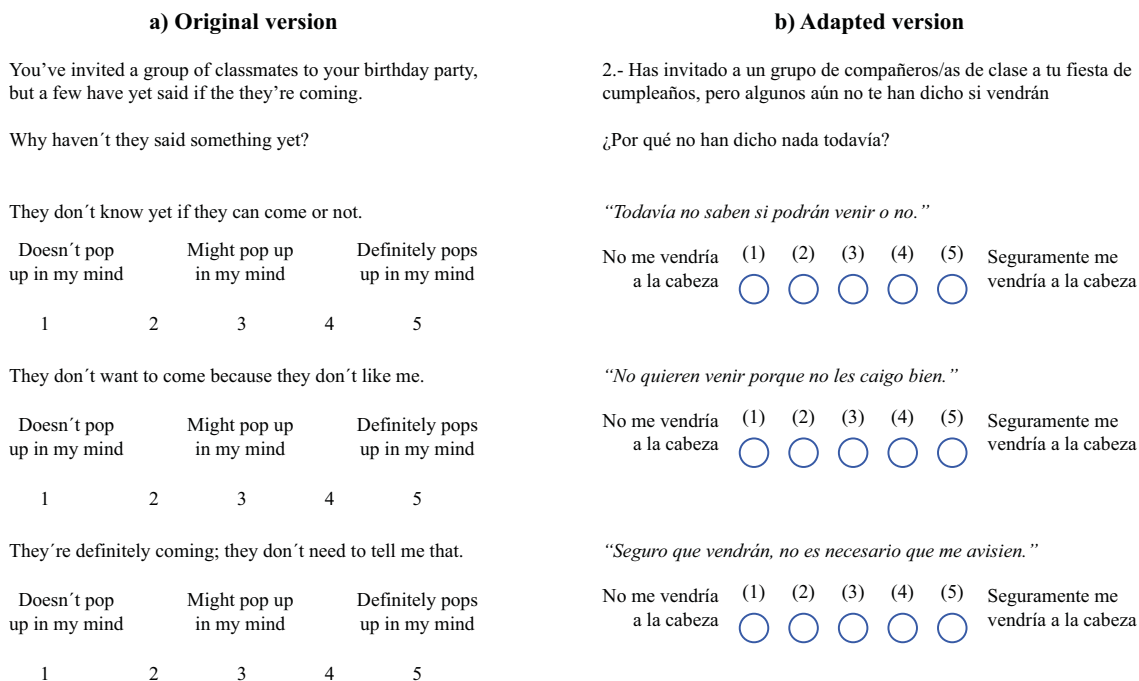
### Instruments

IBs in ambiguous social situations were measured with the AIBQ 2.0 (Miers et al., 2020). The questionnaire describes 17 hypothetical ambiguous situations in which the participant is instructed to imagine themselves (for an example, see Figure 1). The instrument presents three types of situations: five non-social situations, that is, a context that does not have a component of social evaluation (e.g., "You have received bad grades for your last few tests. Why has this happened?"), five offline situations (e.g., "You have just given a presentation in front of your class and afterwards, no one asks a question. Why doesn't anyone ask a question?"), and seven online situations (e.g., "You post a photo of a tasty dish that you have made on Instagram. After an hour, one of your followers responds, 'What dish is that?'"). A specific question follows each description (e.g.,

"What is meant by this response?") with a neutral interpretation (e.g., "It was nearly lunchtime, so everybody wanted to leave"), a negative interpretation (e.g., "They did not think my presentation was interesting"), and a positive one (e.g., "They thought what I said was very clear, and did not need to ask anything"). Participants rated the probability of the occurrence of each interpretation on a 5-point scale ranging from 1 ("does not pop in my mind") to 5 ("definitely pops up in my mind"). Because an IB is understood as a negative or threatening perception, and the negative interpretation is the unique feature that discriminates participants with high and low SA (Miers et al., 2008), only the data of negative interpretation in the online and offline situations were taken into account. The rest of the analyses are hosted in a public repository (<https://osf.io/yru98/>). Previous studies show adequate internal consistency for the online ( $\alpha > .71$ ) and offline ( $\alpha > .75$ ) subscales, and a moderate relation of SA with the online ( $r > .42$ ) and offline scenario subscales ( $r > .68$ ) (Miers et al., 2020). The previous factor analysis also yielded an excellent goodness of fit using four items both for the online and offline scales (Miers et al., 2020). The internal consistency of the version with all the items was measured in the sample of this study using Cronbach's alpha and McDonald's omega. The alpha and omega coefficients were .81 and .86, respectively, for the online dimension, and .74 and .78 for the offline dimension.

The SPSBS (Pinto-Gouveia et al., 2003) was adapted to the Spanish population to assess SBs in SA. The objective of this 17-item scale is to assess the common SBs used by individuals with SA to prevent others' possible negative evaluations in social situations. The statements (e.g., "Avoid attracting attention" or "Trying to look at ease") are rated on a frequency-type scale ranging from 1 (*never*) to 4 (*almost always*). This instrument has been shown to have adequate internal consistency ( $\alpha > .82$ ), moderate test-retest stability ( $r > .69$ ), and moderate relation with SA ( $r > .60$ ) in different languages (Burato et al., 2009; Kocovski et al., 2016; Pinto-Gouveia et al., 2003). The scale also has high discriminant validity—using the SCID-IV clinical interview as the standard—with a sensitivity of .96, a specificity of 1, and an area under the ROC curve of .87 (Burato et al., 2009). This scale was conceptually developed as unidimensional (Pinto-Gouveia et al., 2003). Although some studies have found a two-dimensional structure (Kocovski et al., 2016), most studies have employed the unidimensional version (Burato et al., 2009; Desnoyers et al., 2017). Considering the results of this study, the version without Items 12 and 17 was used. The alpha and omega coefficients of the measure were, respectively, .82 and .85.

The Social Anxiety Scale for Adolescents (SAS-A, La Greca & Lopez, 1998; Spanish version: Olivares et al., 2005) was used to measure SA. This scale is composed of 22 items. Given the distracting purpose of 4 of them, only 18 items measure SA (e.g., "I am ashamed to be surrounded by people I do not know."). These statements are rated on a five-point frequency-type scale ranging from 1 (*never*) to 5 (*all the time*). Original Spanish validations showed excellent internal consistency ( $\alpha > .90$ ) and a three-factor structure in Spanish adolescents (Olivares et al., 2005). This structure was confirmed in another sample of Spanish adolescents and provided evidence of measurement invariance. Authors concluded that there was no invariance in the measurement structure according to sex and age (Ingles et al., 2010). Moreover, the structure of the measure of Spanish version remained invariant compared to North American adolescents (Torregrosa et al., 2022). The Cronbach alpha coefficient was .93, and the McDonald's omega was .94.



**Figure 1.** Example of an item of the Adolescents' Interpretation and Beliefs' Questionnaire (AIBQ 2.0). Note. a) Item of the original version of the AIBQ 2.0, image extracted from Miers et al. (2008). b) Item of the adapted version of the AIBQ 2.0.

**Procedure**

**Adaptation of the Scales for the Spanish Population**

The recommendations for the translation and adaptation of the tests were followed to adapt the SPSBS and the AIBQ 2.0 to Spanish adolescents and young adults (Hernández et al., 2020; Muñiz et al., 2013). These two questionnaires were translated into Spanish, taking into account linguistic and cultural keys, and subsequently, back-translated into English by a professional translator and PhD in Psychology. The back-translated AIBQ 2.0 version was reviewed by the author of the original versions. The version translated into Spanish was slightly modified, considering the feedback of the original author. Both instruments were reviewed by another two experts in the field.

**Data Collection**

We carried out random cluster sampling. Specifically, taking into account the proportion of private and public centers, ten vocational training centers were randomly contacted to participate in the study. In three of them, the directors declined to participate. Then, another two centers were randomly selected, and the directors agreed to participate. The centers provided access to the participants and facilitated a room with computers.

Before data collection, a passive consent form with complete information about the study was sent by the centers to the parents of the minors who would participate in the study. On the day of the data collection, a researcher went to the centers to inform both the minors and the adults about the study characteristics and

request their participation. After giving informed consent, most of the students agreed to participate. Participants completed the questionnaires in an ordinary classroom with a personal computer. They needed approximately 25 to 45 minutes to complete all the measures. The Qualtrics® platform was used for data collection. The Ethics Committee of University of Deusto approved the procedure of this study.

**Data Analysis**

We examined the Mahalanobis distance to identify potential outliers (Goldammer et al., 2020), and each variable was examined graphically. No participant was eliminated in this step. Concerning missing data, 13 participants did not complete AIBQ 2.0, and 4 participants did not report their sex. Little's MCAR test was significant,  $\chi^2(11) = 29.69, p = .002$ , indicating that the missing data were not random. Therefore, all models were estimated using the full information maximum likelihood method (FIML).

The analyses were conducted in two steps. First, the psychometric properties of the adapted scales, SPSBS and AIBQ 2.0, were analyzed in terms of factor structure, internal consistency (Cronbach alpha), and convergence validity (Pearson correlations). To assess the factor structure, confirmatory factor analysis (CFA) and ESEM techniques were used with an orthogonal rotation with MPLUS-8.

Second, path analysis was used to assess the indirect association between IB and SA through SBs. The initial model included paths from IB (both online and offline) to SBs and SA and from SBs to SA. It included age and sex as covariates. To estimate the indirect associations and their 95% confidence intervals (CI), bootstrapping with 5,000 samples was carried out.

The goodness of fit of all models was assessed with the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root mean square error of approximation (RMSEA). These indices were interpreted according to the standard guidelines (Marsh et al., 2005), where values greater than .90 and .95 for CFI/TLI indicate adequate and excellent fit of the data, respectively, and .08 and .06 values for RMSEA indicate acceptable and excellent fit, respectively. Factor loadings greater than .40 were classified as adequate.

**Results**

**Psychometric Properties of the AIBQ 2.0 Adaptation**

Table 1 includes fit indices of all the estimated models. For the AIBQ 2.0, first, a unidimensional CFA was conducted with acceptable fit indices and factor loadings ( $\lambda > .4$ ). Second, a two-dimensional ESEM was estimated with excellent fit indices. Every item of the online dimension, but only two of the five items of the offline dimension, had adequate factor loadings (Table 2). Third, a two-dimensional CFA was run, finding acceptable fit indices and good factor loadings in each dimension (Table 2). Regarding internal consistency, Cronbach’s alphas were .74, .81, and .88, and McDonald’s omegas were .78, .86, and .84, respectively, for offline and online dimensions and total score. The psychometric properties of positive and neutral interpretations of the online and offline scenarios are shown in the supplemental material (SP2 and SP3). The mean differences of this instrument by SA level are shown in SP4. Both tables are hosted in a public repository (<https://osf.io/yru98/>).

**Table 1.** Summary of the Fit Indices of the Factorial Models of the Adolescents’ Interpretation and Beliefs Questionnaire (AIBQ 2.0)

	Chi-square test			RMSEA [90% CI]	CFI	TLI
	$\chi^2$	df	p			
Unidimensional CFA	222.09	54	<.001	.062 [.054, .070]	.974	.968
Two-dimensions ESEM	89.57	43	<.001	.037 [.026, .047]	.993	.989
Two-dimensions CFA	209.11	53	<.001	.060 [.052, .069]	.975	.969

Note. CFA = Confirmatory Factor Analysis; ESEM = Exploratory Structural Equation Modeling; RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker–Lewis index.

**Table 2.** Descriptive Analysis of Items and Factor Loadings for. Factor Loadings for the Two-Dimensional ESEM and One-Factor CFA Solutions for the Adolescents’ Interpretation and Beliefs Questionnaire (AIBQ 2.0)

	Descriptive analysis		Two-dimensional ESEM			Two dimensions CFA		
	M	SD	Off ( $\lambda$ )	On ( $\lambda$ )	$\delta$	Off ( $\lambda$ )	On ( $\lambda$ )	$\delta$
Off 1: birthday invitation	2.19	1.24	.37***	.60***	.51***	.71***	—	.50***
Off 2: school presentation	2.78	1.28	.32***	.45***	.70***	.55***	—	.70***
Off 3: students look at you	3.57	1.24	.56***	.26***	.63***	.47***	—	.77***
Off 4: talking to each other	2.53	1.32	.46***	.58***	.46***	.73***	—	.46***
Off 5: group of fellow students	2.20	1.24	.25***	.68***	.47***	.74***	—	.45***
On 1: no response to message	2.66	1.37	.47***	.55***	.48***	—	.70***	.51***
On 2: friend’s request	2.72	1.33	.39***	.54***	.55***	—	.66***	.56***
On 3: online game	1.80	1.13	.04	.79***	.37***	—	.73***	.46***
On 4: response on Instagram	2.00	1.18	-.02	.70***	.51***	—	.63***	.61***
On 5: Facebook comment	2.25	1.27	.29***	.64***	.51***	—	.70***	.51***
On 6: Twitter followers	2.31	1.31	.23***	.67***	.50***	—	.71***	.50***
On 7: datingsite app	1.86	1.10	.17***	.66***	.54***	—	.68***	.54***

Note. Off = offline; On = online; CFA = Confirmatory Factor Analysis; ESEM = Exploratory Structural Equation Modeling;  $\lambda$  = lambda or factor loading;  $\delta$  = residual variance. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Psychometric Properties of the SPSBS Adaptation**

First, we examined the one-dimensional proposal of the original authors (Pinto-Gouveia et al., 2003), which presented poor fit indices (Table 3),  $\chi^2(119) = 612.10, p < .001, RMSEA = .071, 95\% CI [0.65, 0.076], CFI = 0.89, TLI = 0.87$ . A second CFA was performed in which Item 12 ( $\lambda = .22$ ) and Item 17 ( $\lambda = .20$ ) were discarded, which resulted in acceptable fit indices,  $\chi^2(90) = 612.10, p < .001, RMSEA = .069, 95\% CI [0.63, 0.076], CFI = 0.91, TLI = 0.90$ . After these items were eliminated, the model improved significantly,  $\Delta\chi^2(29) = -166.92, p < .001$ . The one-dimensional version of 15 items showed adequate internal consistency, specifically Cronbach’s alpha of .82, McDonald’s omega of .85, and a Spearman-Brown coefficient for split halves of .77.

**Indirect Association between IBs and SA through SB**

Table 4 shows that online IB, offline IB, and SBs are positive and significantly associated with SA. Online and offline IB measures were significantly and positively correlated with all dimensions of SA. Also, the correlation between online and offline IB was significantly positive, with a Pearson coefficient of .72, suggesting a strong relationship between the two components of IB. Age only showed a significant positive correlation with SA and a significant negative correlation with the total score of IB. These correlations were very low.

A path analysis model indicated that both online and offline IB were directly associated with SBs, but only offline IB was directly associated with SA (Figure 2). This model obtained excellent fit indices,  $\chi^2(1, n = 826) = 0.16, p = 0.69; RMSEA = .00, 95\% CI [0.00, .07], CFI = 1, TLI = 1$ . Figure 2 displays an indirect association between offline IB and SA through SBs. The bootstrap analysis of this indirect association resulted in an estimated coefficient of 0.21 with a 95% confidence interval ranging between 0.15 and 0.26. As the confidence interval does not include zero, the indirect association was interpreted as significant. The age-SA path was also significant, suggesting that older youths have higher levels of SA. Sex was also directly associated with SBs and SA. That is, females use SBs more frequently and have more SA symptoms. Males and older youths have lower IB.

**Table 3.**  
Descriptive Analysis of Items and Factor Loadings for the One-Dimensional CFA Solutions for the Social Phobia Safety Behaviors Scale (SPSBS)

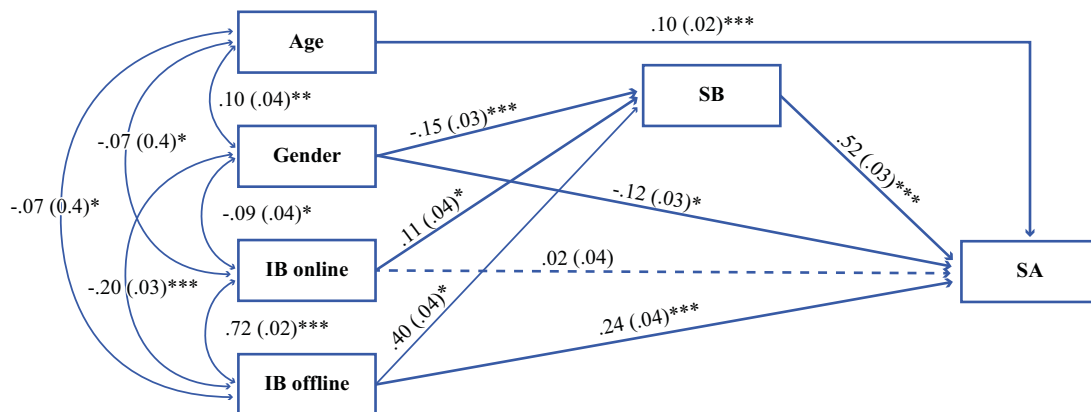
	Descriptive analysis		17 items CFA		15 items CFA	
	<i>M</i>	<i>SD</i>	$\lambda$	$\delta$	$\lambda$	$\delta$
SB1: looking away	0.77	0.78	.58***	.67***	.58***	.65***
SB2: speeding up speech	0.97	0.80	.42***	.77***	.43***	.72***
SB3: shortening speech	0.92	0.79	.59***	.65***	.59***	.66***
SB4: avoiding attracting attention	1.57	0.99	.45***	.79***	.44***	.79***
SB5: sitting in a hidden place	0.79	0.91	.50***	.67***	.51***	.66***
SB6: pretending you are distant	0.85	0.78	.63***	.49***	.64***	.51***
SB7: being a passive spectator	1.11	0.78	.59***	.55***	.56***	.52***
SB8: pretending you did not see someone	1.04	0.77	.50***	.75***	.50***	.75***
SB9: walking with head down	1.17	0.91	.58***	.62***	.59***	.61***
SB10: hands in the pockets	1.69	0.94	.42***	.81***	.42***	.80***
SB11: stop doing something	0.72	0.86	.61***	.63***	.61***	.62***
SB12: trying to look at ease	1.66	0.98	.22***	.87***	—	—
SB13: hiding nervousness	1.11	0.91	.60***	.54***	.59***	.54***
SB14: checking to see if you are presentable	1.36	0.92	.30***	.79***	.29***	.91***
SB15: increasing distance	0.77	0.71	.58***	.66***	.55***	.66***
SB16: disguising the trembling	1.08	0.96	.63***	.52***	.62***	.53***
SB17: thinking very carefully	1.56	0.91	.19***	.96***	—	—

Note. CFA = Confirmatory Factorial Analysis;  $\lambda$  = lambda or factor loading;  $\delta$  = residual variance.  
\*\*\*  $p < .001$ .

**Table 4.**  
Descriptive Analysis and Correlation Matrix Between the Social Phobia Safety Behaviors Scale (SPSBS), the Social Anxiety Scale for Adolescents (SAS), and Negative Interpretation Bias (IB).

	1	2	3	4	5	6
1. SPSBS	-					
2. SAS	.68***	-				
3. AIBQ-Online	.41***	.41***	-			
4. AIBQ-Offline	.50***	.54***	.72***	-		
5. AIBQ-Total	.48***	.50***	.95***	.91***	-	
6. Age	-.03	.07*	-.06	-.07	-.07*	-
Cronbach's alpha	.82	.93	.81	.74	.88	—
McDonald's omega	.85	.94	.86	.78	.84	—
<i>M</i>	19.21	32.11	15.65	13.27	28.94	20.04
<i>SD</i>	7.27	12.45	5.98	4.39	9.64	3.80
<i>N</i>	835	840	828	833	834	834

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .



**Figure 2.**  
Path Analysis Model of the Mediational Association Role of SB between IB, SA, Age, and Gender.  
Note. Gender was coded as a Dummy variable (male = 1). SB = Safety behaviors; IB = Interpretation bias; SA = Social anxiety.

## Discussion

IB and SBs are two risk factors involved in SA. The present study aimed to analyze the cross-sectional relationship between SBs, IB, and SA. We hypothesized that SBs would explain part of the association between IB and SA. Two scales were adapted to Spanish adolescents and young adults to examine these associations: the SPSBS for the evaluation of SBs (Pinto-Gouveia et al., 2003) and the AIBQ 2.0 to assess negative IB in online and offline social situations (Miers et al., 2020).

Both scales showed good psychometric properties regarding con-struct and internal consistency. Concerning the AIBQ 2.0, the ESEM showed that the two-dimensional structure is not clear enough. All items loaded significantly on the same dimension (tentatively, online), where online items had a high loading. However, most items also loaded significantly on the other dimension, where offline items showed better loadings. Thus, the resulting ESEM structure probably reflects a different structure than expected—one dimension for each type of scenario. The authors of the original version also found that Items 1 and 2 of the online dimension followed an unexpected trend. Namely, the exploratory factor analysis conducted by Miers et al. (2020) showed that these two items had a better fit in an offline dimension, so they discarded them. However, the results of the CFA of the present study showed a clear two-dimensional factor structure for the five offline scenarios and the seven online scenarios whose fit indices were excellent. Miers et al. (2020) also showed an adequate two-dimensional structure, resulting in a scale comprising four items for each dimension. These differences in the functioning of the items may be explained by cultural and contextual differences. For example, our study was carried out after the start of the COVID-19 pandemic, which has led to a greater number of relevant social situations being transferred to the online environment, increasing the importance granted to this context and, therefore, the relevance of online items. The internal consistency levels of both subscales were acceptable and similar to those obtained by Miers et al. (2020).

Regarding the SPSBS, the results support a unidimensional solution without Items 12 and 17. This structure is consistent with that obtained by Pinto-Gouveia et al. (2003) and with the validation for the Brazilian sample (Burato et al., 2009). Furthermore, the internal consistency level was acceptable, with similar Cronbach's alpha levels to those in other studies (Kocovski et al., 2016; Pinto-Gouveia et al., 2003).

The results on the relationship between the main variables showed a statistically significant and positive relationship among SBs, IB, and SA. This finding is consistent with previous studies that link SA with IB, both in online and offline contexts (Carruthers et al., 2019; Kingsbury & Coplan, 2016; Miers et al., 2020) and with SBs (Cuming et al., 2009; Kocovski et al., 2016). These findings are also consistent with that of Moscovitch et al. (2013), which showed that the use of SBs in a speech task mediates the relationship between self-portrayal and negative affect. In addition, these data provide evidence of the validity of the adapted scales.

The results of the cross-sectional path analysis suggest a potential mediating mechanism in which SBs would indirectly explain

the relationship between IB and SA. The direct and indirect association between IB and SA was significant in the case of the IB in an offline context. However, online IB was not significantly associated with SA. These results are in line with Miers et al. (2020): the indirect effect of SA on avoidance mediated by IB was significant in the offline context only. Furthermore, and in line with our results, Miers et al. (2020) showed that online IB did not explain the variance of SA after accounting for offline IB. In our data, this can be explained by the large covariance between online and offline IB. Thus, offline IB assumes the variance of SA that online IB explains. As hypothesized, both online IB and offline IB were directly associated with SBs, but the path between online IB and SBs was weaker. This could be explained considering that, even if they were applicable in both contexts, the items of SPSBS are mainly suitable for the offline context.

In offline contexts, these results are congruent with theoretical models of SA (Clark & Wells, 1995), which propose that the interpretation of the online situation is a step prior to the implementation of SBs. In online contexts, IB was not associated directly with the SA level. As explained above, it may be due to statistical reasons. However, it can also be interpreted theoretically: even if there is a negative interpretation of the situation, as online situations are perceived as being less risky than face-to-face situations (Lee & Stapinski, 2012), the IBs in online situations do not produce the same level of SA. Nonetheless, these interpretations should be tested in future research with adequate methodologies.

However, the present cross-sectional study prevents drawing conclusions about the directionality of the associations between variables. There is evidence that the very implementation of SBs could lead to the situation being interpreted as being riskier (Gangemi et al., 2012; van den Hout et al., 2014). Thus, the relationship between SBs and IB may be bidirectional or, as the theory has proposed, belong to a more complex circular relationship together with other constructs such as cognitive schemas (Calvete et al., 2013) or negative self-imagery (Makkar & Grisham, 2011). That is, the directionality of the relationship between these components is not yet clear (Burato et al., 2009; Korte et al., 2015). Therefore, future studies should implement a longitudinal methodology that provides data on the direction of the relationship between the components.

The results of this study should be considered within the framework of the above limitation. Moreover, some other limitations that should be solved in future research. First, the results found in a sample of non-university young adults may not be generalizable to populations with different characteristics—for instance, clinical population. Second, only the Spanish versions of two of the scales were analyzed in the present study and only regarding internal consistency, construct validity, and convergence validity. Therefore, other properties such as test-retest reliability, discriminant validity, measurement invariance between cultures and languages, and the scales' functioning in populations with different characteristics are still unknown. Third, the fact that the instruments were not counterbalanced may be a source of error for internal validity because of the effect of the order of the tests.

Overall, in the absence of validation in other cultures, the present study provides the adaptation of the Spanish version of the

SPSBS scale to assess SBs in SA (Pinto-Gouveia et al., 2003) and the AIBQ 2.0 for the assessment of IB through social scenarios (Miers et al., 2020). These two tools can be very useful in future studies that aim to assess any of these components and in the clinic to know the type of interpretations that the patient usually makes and, especially, the type of SBs that the patient tends to initiate in socially anxious situations.

Furthermore, in the absence of longitudinal studies that allow more conclusive interpretations about the direction of the associations, this study provides preliminary evidence of the potential role of SB as a mediator between IB and SA and reinforces the relevance of IB and SBs in the maintenance of SA. To our knowledge, this is the first study that combines the assessment of SA with that of SBs and IB together, two relevant variables in the main theoretical models of SA (Clark & Wells, 1995). The results suggest that interventions with the dual purpose of reducing IB and SBs could enhance efficacy compared to interventions that only aim to reduce one of the two components (Jones & Sharpe, 2017; McManus et al., 2009).

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