

THE NEED TO BELONG SCALE REVISITED: SPANISH VALIDATION, WORDING EFFECT IN ITS MEASUREMENT, AND ITS RELATIONSHIP WITH SOCIAL NETWORKS USE IN ADOLESCENCE

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During adolescence, the need to belong is a basic motivation that drives the building of strong interpersonal links with peers, and online social networks are one of the most widely used media today for this purpose. A Spanish-adaptation of the Need to Belong Scale (Leary et al., 2013) and a self-developed instrument about the social network uses were administered to a representative sample of 524 adolescents ($M_{age} = 13.57$, $SD = 1.24$). Six models were tested using confirmatory factor analysis, in order to assess the possible effect of the wording on this measure. Our research supports the presence of a wording effect on the Need to Belong Scale and suggests the need to revise the wording of the items of the scales of this construct. Likewise, it was also observed that those adolescents with a high need to belong are using online social networks more frequently and in more varied ways.

Keywords: Need to belong; Need to Belong Scale; Online social networks in adolescence; Item wording effect.

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The need to belong (hereafter, NTB) is a basic human motivation that describes a strong drive to form and maintain a minimum number of meaningful and positive interpersonal relationships (Baumeister & Leary, 1995). Fulfilling this purpose requires seeking frequent and rewarding interaction with others, and such interaction must be stable over time (Leary et al., 2013). During adolescence, the sense of belonging plays a major role in development. Friendships and relationships with peers are part of the identity growth of teens, as they provide opportunities for support, attachment, and identification with role models (Steinberg & Morris, 2001). Research on adolescence shows that having a sense of belonging has significant positive consequences for their physical and psychological health, and for ensuring healthy development as well (for a review, see Allen & Kern, 2017). The widespread use of social media in the adolescent phase makes it necessary to explore the role that may be played by NTB.

ASSESSMENT OF THE NEED TO BELONG

Although NTB has generated a significant amount of research and empirical evidence, this has not been the case with the way it has been evaluated (Malone et al., 2012). While some measures have distin-

guished two dimensions for the assessment of belonging, which do not always coincide in content (see e.g., Lavigne et al., 2011; Malone et al., 2012), other authors have developed single-dimension, comprehensive measures (Leary et al., 2013; Nichols & Webster, 2013). However, most scales do agree on the use of items written with a negative sense. This implies that an indirect assessment of the need to belong is made based on this deficit (see Table 1 for a summary of the measures). Some researchers suggest that balancing the number of negative and positive items could improve subjects' understanding of the issues (Malone et al., 2012).

TABLE 1
 Main measures of the need to belong and belongingness

Authors	Need to belong and belongingness measures
Hagerty & Patusky (1995)	<i>Sense of Belonging Instrument-Psychological Experiences (SOBI-P)</i> : assesses achieved belonging in terms of valued involvement and person–environment fit. <i>Sense of Belonging Instrument-Antecedents (SOBI-A)</i> : assesses the motivation and ability to belong. It measures a general sense of need to belong.
Lee & Robbins (1995)	<i>Social Connectedness Scale</i> : measures “a general emotional distance between self and other that may be experienced even among friends or close peers” (p. 236). <i>Social Assurance Scale</i> : assesses “a general need for reassurance from at least one or more persons for a sense of belongingness” (p. 237). It measures need to belong.
Lavigne et al. (2011)	<i>Belongingness Orientation Scale (BOS)</i> : assesses growth and deficit-reduction orientations. Growth-oriented items reflect a growth and personal blossoming approach to interpersonal relationships. Deficit-reduction oriented items reflect an interpersonal deficit reduction approach to interpersonal relationships (p. 1188). It measures need to belong.
Malone et al. (2012)	<i>The General Belongingness Scale (GBS)</i> : assesses achieved belongingness (distinct from the need to belong) with a two-factor structure (acceptance/inclusion and rejection/exclusion). “Assesses belongingness across multiple levels of specificity ranging from close friends and family to societal others, to an overarching sense of belonging that transcends interpersonal relationships (p. 312)”.
Nichols & Webster (2013)	The single-item need to belong scale (SIN-B). “I have a strong need to belong.”

Furthermore, the Need to Belong Scale (NTBS) by Leary et al. (2013)¹ measures the motivation to be accepted by others and to avoid being rejected by using a single factor. This scale was designed to assess individual differences regarding the need for acceptance and belonging. Therefore, those who score high on this scale are concerned about acceptance and belonging, which leads them to seek more interpersonal relationships, as well as to care about how they are valued by others and to strive to maintain those bonds (Leary et al., 2013). The scale has items related to the positive and negative aspects of NTB. This measure is one of the most widely used measures of this construct and has been translated into several languages. In its translation to French (Sanquirgo et al., 2012), three models were tested using confirmatory factor analysis (CFA). Although they found support for both the one-dimensional model and the correlated three-factor model, the authors considered that these results did not substantially modify the properties of the original scale, and maintained their recommendation to use the original one-dimensional model.

In the Latin American context, this scale has been adapted in Argentina and Brasil. The Argentinean adaptation obtained two factors: the need to belong and the fear of rejection (Leibovich et al., 2018). In the case of the Brazilian adaptation, while a study shows support for the original one-factor structure (Gastal & Pilati, 2016), Lins de Holanda et al. (2018) found that the reversed items did not have sufficient

weight to be added to the model and were excluded from the scale. As pointed out by these authors, “negative items present limitations when incorporated into one-factor measures, which may cause psychometric problems” (Lins de Holanda et al., 2018, p. 146).

An in-depth analysis of the format of this scale confirms to us that it could be susceptible to an effect resulting from the method chosen to write the items. The items on the scale are mostly written with negative statements. There is also the added difficulty that three of these items are reversed (Items 1, 3, and 7). Moreover, one of the items has a double negation (Item 1). This could be the reason for the inconsistency of the studies when validating this instrument.

Current research has shown that the concurrence of direct and reversed items on the same scale influences the quality of the answers given by the respondents, due to the cognitive processes involved in responding (Kamoen, 2012). In addition, there are numerous studies that raise concerns about the psychometric difficulties of constructing scales with both direct and reversed items (for a review, see Tomás et al., 2013). The wording effect has been reported in numerous psychological constructs (Gu et al., 2015; Pastor et al., 2020; Tomás et al., 2013). In fact, a recent study has shown how the combination of direct and reversed items on the same scale produces faulty reliability/validity since it is affected by secondary sources of variance (Suárez-Álvarez et al., 2018). The extent to which the wording effect can influence NTB assessment scales, which have mostly negative item wording and incorporate both direct and reversed items, should be considered.

NEED TO BELONG AND THE USE OF SOCIAL NETWORKS IN ADOLESCENCE

Social networks are the current scenario where adolescents interact with their peers and satisfy their needs for social bonding. The use of social networks by adolescents is focused on social behaviors such as interacting with friends and acquaintances, expressing opinions, and looking for social acceptance (Shapiro & Margolin, 2013). Thus, the online framework can contribute to fulfilling the NTB of adolescents (Nadkarni & Hofmann, 2012; Reich & Vorderer, 2013), since as Baumeister and Leary (1995) have suggested, people can partially satisfy their needs to belong with other interactions that serve as substitutes for close relationships. In social networks, this type of interaction can even occur with celebrities (Greenwood, 2009), with relatives, peers, and even with strangers (Shapiro & Margolin, 2013).

Studies on Facebook show that young people with higher NTB levels use this platform more often (Beyens et al., 2016). Similarly, a relationship has been found between NTB and the increased use of Twitter, with the aim of maintaining parasocial relationships (Iannone et al., 2018). Celebrities or media figures, who adolescents can interact with through social networks, are often seen as sources to fulfill belongingness needs, because para-social relationships facilitate affiliating intimately as a means to connect socially. In the words of Greenwood et al. (2013), “famous others may function as idealized friends with whom to affiliate” (p. 2). In addition, adolescents with higher NTB levels also make greater use of smartphones (Kim et al., 2016), and they tend to have high levels of participation in social networks as well (Tzavela et al., 2017). As pointed out by Ostendorf et al. (2020), NTB is seen as a stimulus for social network use based on the desire to stay in touch with others. Moreover, a significant positive correlation has been detected between NTB and self-presentation on Instagram, especially with regard to ingratiation tactics (Sarita & Suleeman, 2017). Individuals with a high need for social inclusion and belonging care about how they are valued by others and perceive that their self-presentation on social networks could enhance their social connections. For this reason, “the need for belongingness could be a driving force for adolescents’ self-presentation on social networking sites (SNSs)” (Wang et al., 2018, p. 133).

On the other hand, research has also shown that NTB appears to be related to excessive internet use in adolescence. In a study with Italian adolescents, NTB showed a high relationship with intensive internet use in people with high social anxiety and predicted compulsive use of internet communication tools among girls (Casale & Fioravanti, 2015). In addition, several studies conducted with Chinese adolescents showed that NTB was a relevant moderating variable in the relationship between social network addiction and fear of missing out online (FoMO) (Wang et al., 2018; Yin et al., 2019). It seems that people who have not adequately satisfied their need to belong show high NTB scores as a consequence, and are more prone to social comparison and to developing negative emotions, such as envy. These negative emotions would make them more likely to be more aware of what others are doing online and motivate their excessive use of these tools (Yin et al., 2019). Under certain circumstances, NTB may therefore be a driver of excessive use of the internet and social networks, and of the fear of missing out.

By considering all of these diverse contributions, the initial hypothesis of this research states that the particular combination of direct and reversed items in the NTBS of Leary et al. (2013) may be influencing its factor structure and reliability. Therefore, our first objective was to assess the factor structure and reliability of the Spanish adaptation of this scale, and to discover the extent to which it may be influenced by the effect of the wording itself. A second objective of this study was to estimate the extent to which having a high or low NTB influences the use of social networks by adolescents. We want to describe the differences between people with medium-high and low need to belong, to see if there are different profiles of social network use. Our hypothesis states that those adolescents with a medium-high NTB will engage in a more frequent use of both social networks (Hypothesis 1) and instant messaging (Hypothesis 2). These adolescents will also show a greater frequency of use in activities involving monitoring and social contact in their relationships with peers, relatives, or even strangers (Hypothesis 3), more interest in celebrities and in following them as well (Hypothesis 4), a higher level of use and care in self-presentation activities (Hypothesis 5) and, in general, a greater interaction and search for online information of all kinds, leisure, commercial, beauty, news, and so forth. (Hypothesis 6).

METHOD

Participants

A statistically representative sample of students in Secondary Education (ESO) in the Autonomous Region of Madrid (Spain), enrolled during the 2019-2020 academic year, was used. The sample consisted of 524 adolescents ($M_{\text{age}} = 13.57$, $SD = 1.24$; 48.9% girls); with an equal distribution between grades 7 (1st year) to 10 (4th year) of ESO.

A stratified multistage cluster sampling (of secondary schools) was carried out, with proportional allocation according to the nature of the school (public, private, or subsidized) and to whether they corresponded to Madrid capital or other municipalities (based on the criterion of population size and geographical area). Centers were randomly selected for each stratification level and contacted by telephone. When a center refused to participate, another of the same characteristics was randomly selected. The first level of the clusters corresponded to the selection of secondary schools (16 in total). Once the centers had agreed to participate, the specific classrooms that would take part in the survey were randomly selected. The error was set at $\pm 4.37\%$ for the comprehensive data under the assumption of $p=q=0.5$, with a confidence level of 95%, under the assumption of simple random sampling.

Variables and Instruments

The variables assessed in this study were the NTB and the use of social networks.

The NTB was assessed with the Spanish adaptation of the NTBS (Leary et al., 2013). This instrument consists of 10 items with a 5-step Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Some of the direct items in this instrument are phrased using negative statements (e.g., Item 6: I don't like to be alone), while others use positive statements (e.g., Item 5: I want other people to accept me). Moreover, some of the reversed items even contain a double negative sentence (e.g., Item 1: If other people don't seem to accept me, I don't let it affect me). The translation and adaptation of the questionnaire into Spanish was carried out through an iterative process involving two bilingual researchers as recommended by Ramada-Rodilla et al. (2013). The pilot questionnaire was administered to several adolescents to ensure their understanding.

In order to assess the uses of social networks, several self-developed items were administered. Two of them were aimed at assessing the frequency of use of social networks and instant messaging services (e.g., WhatsApp), using a 7-step response scale (1 = *I don't use them* to 7 = *continuously*). Moreover, the different purposes for which adolescents use social networks were assessed based on 21 items (see variables in Table 5), with a 5-step response scale measuring frequency (1 = *never*, 5 = *every day*).

Procedure

After obtaining a favorable evaluation from the Ethics Committee of our institution, professional interviewers went to the different educational centers to administer the questionnaires. They used the CAPI system (computer-assisted personal interview). Prior to this, authorization had been obtained from the schools together with the informed consent of the parents and the adolescents themselves.

Analysis

Confirmatory factor analysis (CFA) was used to assess the best factor structure of the Spanish adaptation of the NTBS. Five competitive models were tested with the original 10 items and one model with seven items (after removing the reversed items). Model 1 (M1) tested the conventional one-dimensional 10-item model of the original study (Leary et al., 2013). Model 2 (M2) tested a bi-factorial structure (need to belong and fear of rejection) based on the study of Leibovich et al. (2018). Model 3 (M3) tested the general factor and an additional factor assessing the weight of the reversed items in the scale. Model 4 (M4) incorporated the general factor and an additional factor with the weight of the direct items in the scale. Model 5 (M5) included the general factor and two additional factors, one with the effect of direct items and another with the effect of reversed items. Model 6 (M6) tested the general factor, eliminating the reversed items (see models in Figure 1).

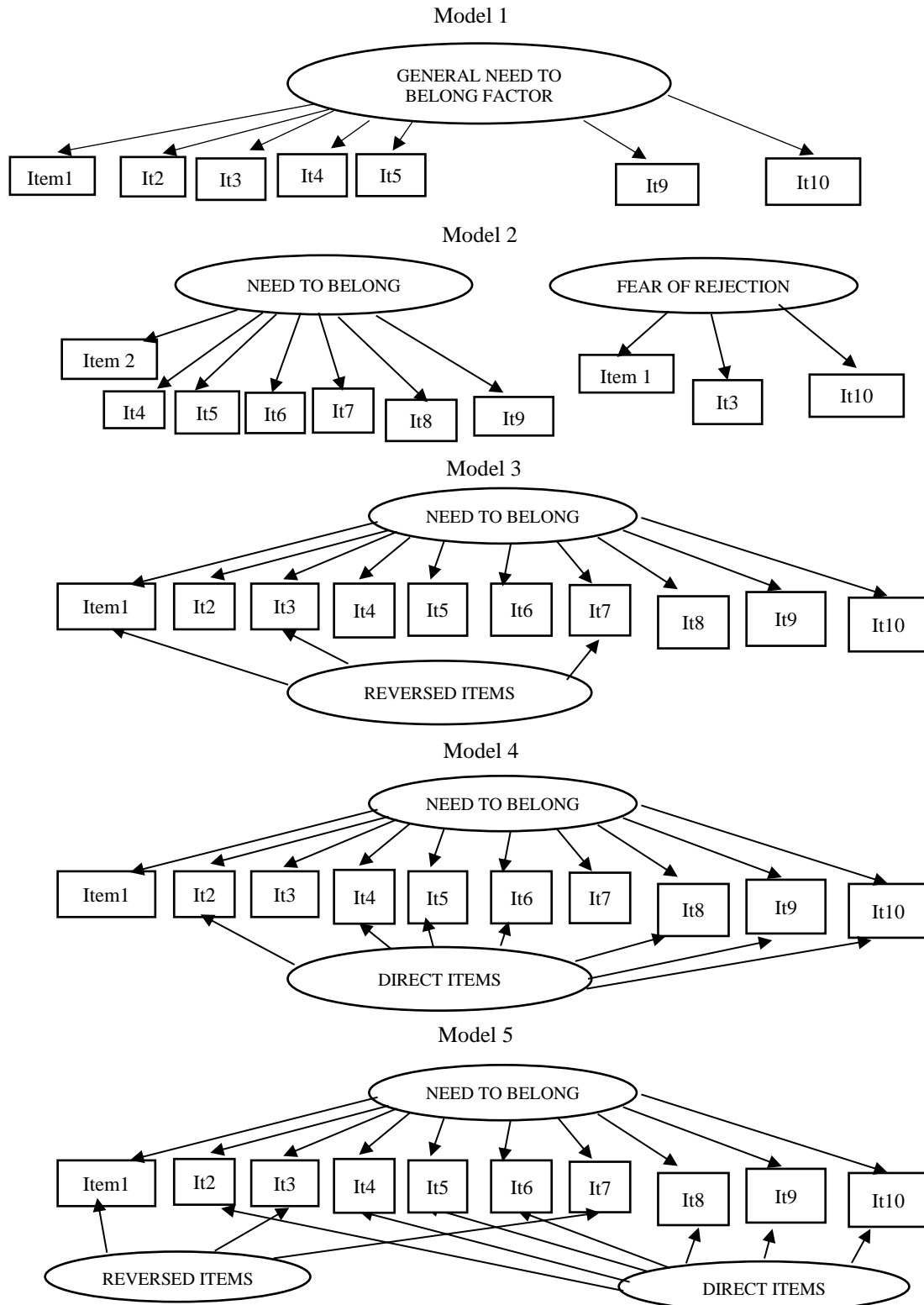


FIGURE 1

Models tested with CFA.

Note. For simplicity, Model 6 has not been represented (it is the same as Model 1 with the inverse Items 1, 3, and 7 removed) and also in all models no residuals are shown, but they were all assumed.

As the data did not follow a normal distribution, the different models were estimated by using the weighted least squares (WLS) method for LISREL 8.80, as well as polychoric correlations and an asymptotic covariance matrix as input for the data analysis. The following indexes were used to assess the goodness of fit of the models: chi-square, comparative fit index (CFI), nonnormed fit index (NNFI) and root mean square error of approximation (RMSEA) with associated confidence intervals (CI). Based on the work of Hu and Bentler (1999), a CFI and NNFI equal to or greater than .90 and an RMSEA equal to or less than .06 would indicate a good fit between the hypothesised model and the data. A value of less than 4 or 5 for the chi-square/*df* ratio was considered a sign of a good fit (Marsh et al., 1988), although others scholars recommended more demanding cut-off points below 3 (Kline, 1998).

In addition, Akaike's information criterion (AIC) was also used to select the most suitable model. The lower value of AIC suggests a better fit (Burnham & Anderson, 1998). In addition, the statistical significance of the estimated parameters and their interpretation were considered. In order to assess the best factor structure and the role that the wording effect might play, the percentage of the explained common variance (ECV) of the different factors within each model was calculated, following the recommendations of Rodríguez et al. (2016). ECV constitutes a good indicator of the degree of unidimensionality of a scale. It refers to the ratio of the variance explained by the general factor divided by the variance of the general factor plus that of the other grouped factors. Higher ECV values would indicate a higher weight of the general factor, and guide researchers in opting for a unidimensional rather than a multidimensional solution. ECV ranges between 0 and 1, and values higher than .70 are interpreted as a good indicator of unidimensionality. The reliability of all models was also calculated using the H and McDonald's omega coefficients. Whereas the first coefficient takes into account factorial scores and tries to estimate the optimal reliability when the factorial solutions show some low and/or negative factor loadings (as is the case); the second coefficient takes into account the error variance of the items. Both offer better estimates than Cronbach's alpha (McNeish, 2017).

In order to assess whether there are differences in the uses made of social networks by young people with high and low NTB scores, two groups were created with the comprehensive average score of this scale (applying the M6) and using the median as the cut-off point. The nonparametric Mann-Whitney *U* test was used to calculate the differences between both.

RESULTS

Factorial Validity and Reliability of the Need to Belong Scale

Table 2 shows the adjustment indexes of the different models after carrying out the CFA. With regard to the comparative models (M1-M5), progressive improvement in the adjustment of the models was observed, with M5 being the one that offers the best adjustment to the data (CFI and NNFI above .90, RMSEA equal to .06, and it shows the lowest AIC). This model (M5) includes a general NTB factor and two additional factors that test the wording effect (one with the reversed items and one with the direct items). This has allowed us to conclude that the combination of reversed and direct items in this instrument may be compromising the validity and reliability of the instrument. For this reason, M6 was tested (in which the reversed items were removed). The adjustment of this latter model (M6) outperforms by far all the other predicted models — CFI and NNFI are at or above .97, the χ^2/df ratio is below 3, following more

demanding criteria (Kline, 1998), the 90% CI of the RMSEA is even below .06, and the AIC is the lowest of all the models.

TABLE 2
 Fit index of the competitive models

Model	χ^2	<i>df</i>	χ^2/df	RMSEA [90% CI]	CFI	NNFI	AIC
M1	157.18	35	4.49	.082 [.069, .095]	.90	.88	197.18
M2	152.56	34	4.48	.082 [.069, .095]	.91	.88	194.55
M3	101.25	31	3.26	.066 [.052, .080]	.94	.92	149.25
M4	97.47	27	3.61	.071 [.056, .086]	.94	.91	153.47
M5	68.62	22	3.11	.064 [.047, .081]	.96	.93	134.62
M6 (7 items)	31.27	14	2.23	.049 [.026, .072]	.98	.97	59.27

Note. χ^2 = chi-square; *df*= degrees of freedom; χ^2/df = ratio chi-square by degrees of freedom; RMSEA = root mean square error of approximation; CI = confidence interval; CFI = comparative fit index; NNFI = nonnormed fit index; AIC = Akaike's information criterion.

Considering the level of statistical significance of the estimated parameters of each model, it can be observed that in Models 1, 2, and 6, all parameters are statistically significant, and their sign corresponds to the expected theoretical direction. The percentage of significant parameters is 95.74% in Model 3, 87.75% in Model 4, and 84.61% in Model 5. The percentage of items with a negative sign (indicating poor item quality) is 2.2% in Model 3, 2.04% in Model 4, and 5.76% in Model 5 (see Table 3). This may be interpreted as an artifact that the combination of direct-reversed items and the complexity of the model introduces into them.

TABLE 3
 Standardized factor loadings of the six CFA models

Items	Model 1	Model 2		Model 3		Model 4		Model 5			Model 6
	GNTB	NTB	FR	NTB	RI	NTB	DI	NTB	DI	RI	GNTB
NTB1	.48		.48	.10 ^a	.55	.61		.08 ^a		.84	
NTB2	.78	.77		.78		.18	.63	.22	.54		.72
NTB3	.73		.72	.43	.44	.85		.68		-.03 ^a	
NTB4	.79	.80		.80		.13	.72	.26	.56		.76
NTB5	.88	.87		.88		.17	.77	.19	.71		.84
NTB6	.77	.77		.79		.17	.66	.23	.57		.73
NTB7	.44	.44		-.26	.69	.50		.12		.35	
NTB8	.83	.83		.85		.02 ^a	.84	-.08 ^a	.92		.83
NTB9	.81	.80		.82		.06 ^a	.78	.04 ^a	.75		.76
NTB10	.79		.76	.80		-.08 ^a	.87	-.18	.97		.79

Note. GNTB = general need to belong factor; NTB = need to belong; FR = fear of rejection; RI = reversed items; DI = direct items.
^a Factor loadings are not significantly different from zero ($p > .05$).

The percentage of total explained variance by Models 1 to 5 ranges from 53.54% to 59.16%. Model 6 has the lowest percentage of total explained variance (42.25%), which is understandable given the fact that it has three items less than the rest. Regarding the contribution of the different factors to the total explained variance in each model, it is worth noting that in Model 5 the theoretical factor explains only 7.31%, while the direct items factor explains 37.84%, and the inverse items factor explains 8.29% of variance. Regarding the explained common variance, the ECV for Models 2 and 3 presents values of .75 and .83 respectively, which would indicate that the general factor explains more than two thirds of the common variance. This would provide further support for the one-factor solution. However, the information provided by the ECV for Models 4 and 5 might seem to provide contradictory information, since it gives values of .26 and .13. These can again be interpreted as the confounding effects of the combination of direct and inverse items in the questionnaire, resulting in a higher weighting of the method factors against the construct assessed.

The reliability of the factors of the different models can be seen in Table 4. It is worth noting that the general NTB factor has a reliability above .90 in Model 1 and Model 6 in the two indexes studied (H and McDonald's omega). The reversed item factors in Models 3 and 5 show the lowest reliability indexes (between .42 and .71). It should also be noted that the general factors in the models in which the effect of the direct items (M4 and M5) is studied have lower reliability (between .36 and .78), as these items have much higher and more stable factor loadings in the factors referring to the wording effect.

TABLE 4
 Reliability coefficients (H and McDonald's omega) of the different factors

Factors	M1		M2		M3		M4		M5		M6	
	H	ω	H	ω	H	ω	H	ω	H	ω	H	ω
General need to belong factor	.94	.92			.93	.90	.78	.62	.53	.36	.92	.91
Specific need to belong factor			.92	.90								
Fear of rejection factor			.73	.69								
Direct item factor							.91	.92	.96	.90		
Reversed item factor					.61	.62			.71	.42		

Need to Belong and the Use of Social Networks

Table 5 shows the descriptive statistics (Median and Interquartile range) of the different variables of social network and WhatsApp use based on the two groups with high and low NTB, as well as the results of the statistical test to compare them (Mann-Whitney *U* test). Those adolescents in the high NTB group showed a higher frequency of social networking and WhatsApp use than those in the low NTB group. In general terms, those adolescents in the high NTB group used social networks more frequently for social purposes (e.g., watching videos or seeing photos of friends, playing online games, talking to friends, etc.). Although they watched more music videos, they also conducted more searches for films, information about leisure activities, celebrities, entertaining content, health, commercial information, and current news. However, it should be noted that the differences between the two groups are rather small.

TABLE 5
Descriptive variables (*Mdn*, *IQR*) of the uses made of social networks by the NTB groups (high or low)

Variables*	Low NTB		High NTB		<i>U</i>	<i>p</i>
	<i>Mdn</i>	<i>IQR</i>	<i>Mdn</i>	<i>IQR</i>		
H1: Frequency of social media use	5	6-3	6	7-5	41406.50	.005
H2: Frequency of WhatsApp use	6	5-6	6	7-5	42541.00	.001
H3: Talking to friends	5	5-4	5	5-5	31866.00	.001
H3: Playing online	3	4-1	3	5-1	30957.00	.040
H3: Talking to relatives	4	5-3	5	5-4	30023.00	.137
H3: View videos or photos of friends and family	3	4.3-2	4	5-3	34122.50	.000
H3: View videos or photos of strangers	2	3-1	4	5-3	30034.50	.150
H4: Follow my favorite actors, singers, influencers, etc.	3	5-2	4	5-3	31260.50	.023
H4: Search for information about celebrities	3	4-2	3	4-2	33703.00	.000
H5: Publish/post personal content on my profile	2	3-1	2	4-1	30633.50	.066
H5: Updates on what I do or where I am	1	2-1	2	3-1	30471.00	.073
H6: Buying and selling	1	2-1	1	2-1	28699.00	.584
H6: Reading current news	2	3-1	2	3-1	30923.00	.040 ¹
H6: Search for commercial information	2	3-1	2	3.9-1	32579.00	.001
H6: Search for content about my hobbies	3	4-2	3	4-2	28470.50	.740
H6: Search for entertaining content	4	5-2.4	4	5-3	31621.50	.012
H6: Search for health/well-being information	1	2-1	2	3-1	30990.00	.030
H6: Search for information on fashion, beauty, and style	2	3-1	2	3-1	27683.50	.829
H6: Search for information on leisure activities	2	3-2	3	4-2	31256.00	.024
H6: Search for sports content	2	4-1	3	4-1	30616.00	.068
H6: Search for TV series, films, or TV programmes	3	4-2	4	5-3	32166.50	.004
H6: Sharing and commenting on news	2	3-1	2	3-1	30598.00	.063
H6: Watching videos and music	5	5-3	5	5-4	31890.50	.003

Note. NTB = need to belong. H1 to H6 refer to the hypothesis linked to each variable.

¹ Although the dispersion measures reported are apparently equal, a close examination of the scatter plots shows differences between the groups and the test used is sensitive to such differences.

DISCUSSION

The first aim of this study was to assess the psychometric properties of the Spanish adaptation of the Need to Belong Scale (Leary et al., 2013) with an adolescent population. The writing style of the original scale items, many of them written with negative wording, together with the combination of direct and reversed items, led us to the hypothesis of a possible wording effect that could have psychometric consequences.

To ascertain this hypothesis, we tested six different models using CFA. Among the models that included the 10 original items (M1-M5), the one that shows the best adjustment indexes is M5, which is precisely the model that includes the general NTB factor and two factors that assessed the weight of the direct and the reversed items in the model. This would indicate that the combination of items influences the construct validity of this instrument. If we look at the quality of the factorial solution found, it is worth noting that M5 is the one with the lowest number of significant parameters and the one that offers more parameters with an opposite sign to the one expected. This would confirm the psychometric artifacts generated by the effect of the wording described. Likewise, M5 shows how the general NTB factor explains a low percentage of variance (7.31%) compared to the wording effect factors, which together explain 46.13%. In addition, the ECV for Models 2 and 3 provided greater support for the one-factor solution, whereas for Models 4 and 5 it showed the negative effect that item wording had on this measure. When the reversed items (M6) are removed, the factor solution shows a very good fit to the data, as shown by all the indexes considered, and has high quality (all parameters are significant and show their sign in the expected direction). Regarding reliability, the general NTB factor of M1 and M6 display the best data, both with the H and McDonald's omega. When the effect of the wording is introduced in M4 and M5, reliability decreases significantly. All of this allows us to affirm that the distribution of direct and reversed items in this scale produces psychometric artifacts that particularly affect its factorial validity and reliability.

Regarding the Argentinian study with this scale (Leibovich et al., 2018), which showed that two dimensions might provide a better factorial solution (our M2), it should be noted that the resulting three-item subscale contained precisely two of the reversed items, which could indicate that the wording effect would favor this factorial solution, yet in fact it has only slight validity. The ECV of Model 2 shows that the one-factor solution is the best solution in our data. This conclusion is also confirmed by a comparison of the models with our data (M1-M5). Similarly, the results found in the research by Sanquirgo et al. (2012) could be further evidence of artifacts in the wording of the items, direct and reversed. In their study, Item 1 appears in a single factor, which is explained not by its differential content, but by the comprehension and interpretation problems involved when a respondent reads statements with a double negation. In line with the research carried out by Lins de Holanda et al. (2018), we assert (this time with statistical evidence to support our claim), that the best solution for guaranteeing the validity and reliability of this instrument is the elimination of reversed items, as they affect the psychometric quality of the instrument. These psychometric artifacts produced by the writing style of direct and reversed items in the same scale have been extensively researched in the literature with various psychological constructs (Suárez-Álvarez et al., 2018; Tomás et al., 2013). As a recommendation for continuing to use the original 10 items of this scale, our data suggest the need to change the wording of the reversed items and convert them into direct items. This would provide an instrument that would fully guarantee the content validity of the original.

The second objective of this study was to assess the extent to which having a high or low NTB is reflected in the differential use of social networks by adolescents. In this regard, it was observed that those with a high NTB show a higher frequency of use of social networks (Hypothesis 1) and WhatsApp (Hy-

pothesis 2) compared to those with a low NTB. This finding confirms our first two hypotheses and accords with other studies which indicate that NTB is a key factor in driving the use of different social media (Beyens et al., 2016; Ostendorf et al., 2020; Tzavela et al., 2017).

Moreover, it was found that adolescents with higher NTB levels also show a higher frequency of online activities aimed at fostering and maintaining relationships with peers, thereby partially confirming Hypothesis 3. Thus, it has been observed that those with high NTB see videos and photos of friends, play online (usually done by interacting with peers), and talk to friends more frequently. As pointed out by Baumeister and Leary (1995), NTB is a strong driving force that leads us to foster and maintain a minimum number of positive, meaningful, interpersonal relationships. This drive is a basic motivation that fosters the use of social media in activities involving interaction with peers. However, NTB does not drive increased use of networks to contact family members or strangers. This could be explained by the fact that it is peers who can truly provide the attainment of authentic belonging during adolescence (Shapiro & Margolin, 2013).

Adolescents with a high NTB also show greater interest in parasocial relationships, as pointed out by Iannone et al. (2018), thus confirming Hypothesis 4. These results support the role of social networks as platforms through which adolescents seek identity role models in celebrities or influencers that satisfy their NTB (Greenwood et al., 2013; Pérez-Torres et al., 2018).

In spite of the outcomes above, our results did not support Hypothesis 5, which associates a higher level of NTB with a greater inclination to engage in self-presentation activities on social networks, such as posting personal content on one's profile or offering updates about what they do. These data contradict the results of other research that has detected a positive and significant correlation between NTB and self-presentation on Instagram, especially regarding the ingratiation tactic (Sarita & Suleeman, 2017). It should be noted that our study does not assess the specific self-presentation strategies that adolescents may be implementing, but only the frequency with which they update their profiles.

Our data also showed a higher frequency of online leisure activities and search for information on this topic among adolescents with high NTB (watching videos or listening to music, searching for entertaining content, browsing for series or films, etc.). As pointed out by Leversen et al. (2012), leisure during adolescence can be a way of satisfying our most basic needs, among which is the need to belong. Hypothesis 6 is partially fulfilled as not all uses showed significant differences. The relationship between NTB and online entertainment is a line of research that still needs to be examined.

Our results are initial, yet they offer some answers about the association between NTB and the social networking activities of adolescents. The desire to build meaningful social relationships is undoubtedly driving the use of social networks at this developmental stage. Future studies should attempt to unravel the conditions in which this drive might contribute to healthy online interaction that would promote adolescent well-being, as traditionally noted in the literature on this variable (Baumeister & Leary, 1995) or, in the opposite way, may lead to problematic use of social networks (Ostendorf et al., 2020).

One of the shortcomings of this study is that the representative sample used is from the Autonomous Region of Madrid, which means that the results are not applicable to other areas. However, the representativeness of the sample and the explanatory nature of the study gives us confidence in the results obtained. Another shortcoming of our work is the use of a self-developed questionnaire to assess the uses of social networks, which is neither standardized nor validated. This has been a common practice among scholars in this field in order to survey changing trends in the use of social media. It should be noted that the design of the questionnaire was based on a preliminary research study with focus groups involving adolescents (Martín-Nieto et al., 2017; Pastor et al., 2019).

With regard to the main conclusions of this study, we would like to emphasize the need to review the wording of the items of the NTB instruments, and to assess the effects of such items on the validity and reliability. It also bears mentioning that it is important to further explore the relationship between NTB and the uses made of social networks, and their contribution to adolescent well-being.

NOTE

1. Available since 2007 as an unpublished manuscript. Leary, M., Kelly, K., Cottrell, C., & Schreindorfer, L. (2007). *Individual differences in the need to belong: Mapping the nomological network*. Unpublished manuscript, Duke University. <https://sites.duke.edu/leary/files/2019/05/NTB.pdf>

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