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ORIGINAL ARTICLE

Assessing the Psychometric Properties of the Functional Analytic Psychotherapy Intimacy Scale (FAPIS) in a Spanish-Speaking Population

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Abstract

Intimacy is an interpersonal repertoire related to physical and behavioral health indicators. Functional analytic psychotherapy (FAP) is a behavioral intervention that has demonstrated utility in improving intimacy repertoires, particularly in experimental single-case designs. The FAP Intimacy Scale (FAPIS) was developed with the aim of using a theoretically sound measure to evaluate FAP effects on a large scale. This study sought to culturally adapt and validate the FAPIS for Spanish-speaking populations. A total sample of 509 Spanish-speaking participants completed the survey. Exploratory and confirmatory factor analyses were conducted to examine FAPIS psychometric properties. A network analysis was also performed to assess the relation among scale factors. As expected, the FAPIS Spanish version demonstrated a good fit, meeting the same three-factor structure as the original version. Network loading along three factors was also found, and item 3 was identified as the most central item in the scale. Low and negative correlations among FAPIS, experiential avoidance, emotional sensitivity, and social impact were found. Findings showed that FAPIS is a valid and reliable measure for assessing intimacy in Spanish-speaking populations.

Keywords Intimacy · Functional analytic psychotherapy · Spanish-speaking · Adaptation · Validation · Psychometric assessment

Interpersonal difficulties are common, chronic, and costly (Wright et al., 2022). Intimacy problems are one of the most common interpersonal struggles, which often lead to social dysfunction and other behavioral health problems such as major depression, obsessive-compulsive disorder, trichotillomania, eating disorders (Wetterneck & Hart, 2012), and anxiety (Przeworski et al., 2011). On the other hand, engaging in intimacy behaviors is related to good indicators of social connectedness and physical health (Smith & Baucom, 2017; Toh et al., 2022). From a behavioral stance, intimacy is defined as "a process that emerges from a sequence of events in which behavior vulnerable to interpersonal punishment is [socially positively] reinforced by the response of another person" (Cordova & Scott, 2001, p. 75).

Some evidence supports the view that engaging in intimate interactions facilitates interpersonal emotional regulation, the skill to manage emotions through the other's influence (Barthel et al., 2018). Marital research has found that intimacy partially explains the relation between couples' satisfaction and emotional skills in relationships (Cordova et al., 2005; Mirgain & Cordova, 2007). In comparison, fear of intimacy hinders the development of intimate relationships, showing a significant negative correlation with intimacy and social connectedness (Toh et al., 2022). A study found that people reporting fear of intimacy and social anxiety tend to engage in emotional avoidant behaviors to regulate their emotions, leading to an increase in social anxiety (Kashdan et al., 2014). Thus, experiential avoidance seems to be a significant predictor for fear of intimacy (Maitland, 2020).

Functional analytic psychotherapy (FAP; Kohlenberg & Tsai, 1991), a behaviorally based intervention for

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interpersonal functioning, proposes that the therapeutic relationship is the context in which therapists provide natural contingencies in order to reinforce and shape client's interpersonally effective behaviors (i.e., clinically relevant behaviors [CRB]) such as intimacy repertoires. FAP's interpersonal context is suitable for shaping clients' intimacy repertoires, as therapists are able to provide immediate social reinforcement to vulnerable behavior within the therapeutic session. FAP has demonstrated positive effects on intimacy and other interpersonal behaviors. However, most studies have conducted single-case designs that mainly use observational measures (e.g., coding behavioral systems and self-records) for evaluating treatment outcomes (Singh & O'Brien, 2018).

Leonard et al. (2014) highlighted a lack of a FAP theory-based measure that assesses intimacy relative to a particular relational context (e.g., romantic, friendships, parental). Although multiple scales such as the Intimate Risk Taking Scale from the Authenticity in Relationships Scale (AIRS; Lopez & Rice, 2006), the Close Relationships Questionnaire (CRQ; Maxwell, 1985), the Fear of Intimacy Scale (FIS; Descutner & Thelen, 1991), the Functional Idiographic Assessment Template–Questionnaire (FIAT-Q; Callaghan, 2006), the Marital Intimacy Questionnaire (MIQ; Van den Broucke et al., 1995), and the Miller Social Intimacy Scale (MSIS; Miller & Lefcourt, 1982) evaluate various intimacy features, they do not capture with fidelity the characteristics of intimacy in FAP. Based on this, Leonard et al. (2014) developed the FAP Intimacy Scale (FAPIS), a measure that assesses intimacy relative to a prespecified type of relationship. The FAPIS measures the following three intimacy repertoires that are consistent with FAP theory: (1) Hidden Thoughts and Feelings; (2) Expression of Positive Feelings; and (3) Honesty and Genuineness.

After performing a confirmatory factor analysis that demonstrated a good fit (RMSEA = 0.07, SRMR = 0.04, CFI = 0.96, TLI = 0.95), Leonard et al. (2014) verified the FAPIS three-factor structure. Moreover, medium-to-large correlations were found between the three factors. Each factor of the FAPIS as well as the total score showed good-to-excellent internal reliability (Hidden Thoughts and Feelings, $\alpha = 0.86$; Expression of Positive Emotions, $\alpha = 0.93$; Honesty and Genuineness, $\alpha = 0.92$; and FAPIS, total $\alpha = 0.91$). Singh et al. (2020) administered the measure to a clinical sample and performed several CFA analyses. They found that the FAPIS three-factor model has the best data fit as well as good reliability, suggesting measurement invariance across undergraduate and clinical samples. Although FAPIS has demonstrated good internal consistency, test–retest reliability, and construct validity, this measure has only been tested in English-speaking populations within the United States. The impact of intimacy-related problems on people's daily functioning rises worldwide (Wright et al., 2022); therefore, it is important to have adapted and valid measures of intimacy in diverse language populations. The psychometric assessment of the FAPIS in Spanish would aid clinicians and researchers to have a behaviorally sound measure to reliably track clients' and participants' improvements in intimacy. To do so, this study sought to evaluate the psychometric properties of the FAPIS in Spanish-speaking participants. Based on previous research, we expected to find a three-factor structure with good internal consistency.

Method

Participants and Procedures

After receiving approval from the local IRB at the University de los Andes IRB (Ethics approval #1507), instruments were translated and culturally adapted to Spanish following Sousa and Rojjanasrirat's (2011) guidelines. After adapting FAPIS items, psychometric properties were evaluated in self-identified Latine participants recruited using public advertisement and snowball methods.

Cultural Adaptation and Face Validity

Two independent bilingual translators performed a forward translation to Spanish. Both translators were native Spanish speakers; one of them held a PhD. in Behavior Analysis and had lived in the United States for 14 years; the other held a PhD in clinical psychology and had lived in the United States for 5 years. A second-generation American-English speaker fluent in Spanish with a PhD in clinical psychology subsequently compared both translations, offering a quantitative evaluation of clarity and coherence and qualitative feedback about the items' ambiguities and discrepancies in word use, sentence clarity, and meaning. Based on her feedback, the adjusted items were backward translated to English by two independent native English speakers from Latinx families living in the United States; they each held a PhD in clinical psychology. Further, three Spanish-speaking psychologists from Colombia (PhD in clinical psychology), Argentina (PhD in psychology), and the United States (PhD in clinical psychology) reviewed the two translations and selected from between these the clearest alternative items that were easiest to understand for the target population; in addition, they provided an evaluation of the items' content regarding the type of construct they believed each item was assessing. After this step, researchers adjusted and selected those items that had a better cultural fit (see adjustments on https://osf.io/c6t5q/?view_only=e363457bbcbf4ce2850977eca0e494d5).

FAPIS face validity was assessed through a focus group conducted with four native Spanish-speaking participants (two Argentinians, one Colombian, and one Ecuadorian who

lived in the United States). Participants were asked to provide quantitative evaluation for item clarity and qualitative feedback about language-usage in their communities. They rated each item on a 5-point Likert scale from 1 (*totally unclear*) to 5 (*totally clear*). Items rated below 4 were discussed and adjusted by the group in order to enhance clarity and/or gender inclusion. For example, item 3 was adjusted from "Me sentí cómodo al discutir problemas significativos con esta persona" to "Me sentí cómodo/a al discutir problemas significativos con esta persona" (to review other changes see OSF: osf>contributors>links). In general, FAPIS items were rated as clear ($M = 4.98$).

FAPIS Psychometric Evaluation

Participants were recruited at two different stages. The first stage of recruitment was conducted through public advertisement on social media (LinkedIn, Instagram, Facebook, etc.). Colombian and Argentinian collaborators shared the study's invitation on their social media, including a Qualtrics link. Once participants clicked on the link, they were redirected to a webpage where they found the informed consent and the survey. Researchers in Bogotá (Colombia) also put-up posters in private universities and public places (e.g., coffee shops) inviting people to participate in the study. The second recruitment stage was conducted in public places in Bogotá (Colombia). A research assistant (RA) approached people on public places and asked them to participate in the study. After signing the informed consent and completing the survey, participants received a U.S. $4 grocery voucher and were asked to share the link with people in their social circle (using a snowball method). Participants recruited by referrals did not receive a voucher for completing the survey due to limited funding.

A total of 576 participants signed an informed consent following APA and 1964 Helsinki Declaration standards. Data from individuals who did not complete sociodemographic information or FAPIS items were eliminated (11.63%). During the first recruitment, 248 participants (70.97% females) were recruited and 261 (59.77% females) in the second. All participants who completed the FAPIS also filled the external criteria validity questionaries. Data analysis was conducted with a sample of 509 participants.

Instruments

Functional Analytic Psychotherapy Intimacy Scale (FAPIS; Leonard et al., 2014)

The FAPIS is a 14-item self-report measure on a 7-point Likert scale (0 = *not at all*; 6 = *completely*) that assesses intimacy-related behaviors in the context of a specific relationship (e.g., friend, family member, romantic partner) in the last week. This scale is comprised of three subscales: (1) Hidden Thoughts and Feelings; (2) Expression of Positive Feelings; and (3) Honesty and Genuineness. The FAPIS has a good factor structure, internal consistency, test–retest reliability, and construct validity in a North American English-Speaking samples (Cronbach's alpha between $\alpha = 0.82$ and 0.85, see Leonard et al., 2014).

Acceptance and Action Questionnaire, second version (AAQ-II ; Bond et al., 2011)

The AAQ-II is a 7-item measure of acceptance and experiential avoidance. Items are rated on a 7-point Likert scale (1 = *never true*; 7 = *always*). The AAQ-II Spanish version administered in this study has good construct, discriminant, and convergent validity as well as very good internal consistency according to Cronbach's alpha ($\alpha = 0.91$; Ruiz et al., 2016).

Functional Idiographic Assessment Template-R (FIAT-R; Stanton, 2020)

The FIAT-R instrument is a 32-item on a 7-point Likert scale (0 = *completely disagree*; 6 = *completely agree*). This scale measures interpersonal functioning and comprises two subscales with excellent reliability according to Cronbach's alpha: (1) Emotional Sensitivity ($\alpha = 0.93$), People's Difficulties in Understanding and Managing Their Emotions; and (2) Social Impact ($\alpha = 0.93$), People's Ability to Recognize Their Own Needs, Manage Interpersonal Conflicts, and Discern Their Impact on Others. A culturally adapted Spanish version of the FIAT-R was administered in this study ($\alpha = 0.8$, *masked paper*).

Perceived Privilege Status (Adler et al., 1994)

This self-report instrument is a 1-item measure through which participants report their perceived level of privilege defined as the perceived socioeconomic status in society as compared with others in the community (Adler et al., 1994). This item is rated on a 10-point Likert scale (0 = *being part of the group of people with the fewest privileges*; 9 = *being part of the group of people with the most privileges*). Scores between 0 and 3 indicate a low perceived level of privilege; between 4 and 6 a moderate perceived level of privilege; and between 7 and 9 a high perceived level of privilege.

Relational Status

On the sociodemographic assessment, participants reported information about their cohabitation (0 = *living alone*; 1 = *living with someone*), the number of people with whom they lived, and the type of relationship with the people with whom they live (e.g., partners, friends,

parents, among others). Also, they reported whether they had close friendships (0 = *no*; 1 = *yes*) and how many close friends they had.

Data Analysis

Construct validity was assessed through sequentially performed exploratory (EFA) and confirmatory factor analyses (CFA) using the Lavaan package in R. Full information maximum likelihood estimators (MLF) were utilized in the CFA to run the analysis for missing data. Two complementary analyses were performed to assess reliability: Cronbach's alpha (α) and McDonald's omega (ω). Finally, a network analysis of the FAPIS data, a heuristic strategy to evaluate the association among factors, was performed. Networks centrality, clustering, and stability and their plots were run using the *EGAnet* and *qgraph* R libraries (Golino & Christensen. 2022; Epskamp et al., 2012). All analyses were performed with the R statistical language (R Core Team, 2022), Rstudio v.4.2.2. Data and code are publicly available at the public data repository (see https://osf.io/e5xfn/?view_only=4c3ea816f2cc4fac9c84a69fbc527fad).

Results

Descriptive Analysis

The final sample consisted of 509 participants (65.2% female) between 18 and 100 years old ($M = 34.07$; $SD = 13.85$). The majority of participants reported Colombia (78.6%) as their country of origin, followed by Argentina (15.3%), with a small percentage coming from other Latin-American countries (5.03%) and Anglo-Speaking countries (0.78%). In terms of education level, many participants had at least a bachelor's degree (bachelor = 15.2%; postgraduate=22%) and reported a moderate level of privilege (57.4%; Table 1).

Because intimacy repertoires involve a series of behaviors displayed in close relationships, participants' relational status was asked. On co-habitation, 71 participants reported living alone, while the remaining 438 (86.1%) lived with other people, mostly their partners, siblings, parents, and/or roommates. Regarding close friendships, 465 (91.4%) people reported having at least one close friendship.

On FAPIS descriptive statistics, means and standard deviations of each item, subscales (Honesty and Genuineness, Expression of Positive Emotions, and Hidden Thoughts and Feelings) and sum scores are presented in Table 2. Honesty and Genuineness and Expression of Positive Emotions items were highly rated ($M > 4$) while items in the Hidden Thoughts and Feelings subscale were moderately rated ($M > 3$). Internal consistency was high for all three factors as well as the FAPIS sum score (Table 2).

Table 1 Sample Sociodemographic Characteristics

Demographics	*n*	Percentage (%)
Sex Assigned at Birth		
Male	175	34.4
Female	332	65.2
Other	2	0.393
Age Group		
Young Adults	264	51.9
Adult	198	38.9
Older Adults	46	9.04
Other	1	0.196
Country of Origin		
Argentina	78	15.3
Chile	1	0.196
Colombia	400	78.6
Ecuador	1	0.196
Guatemala	1	0.196
México	6	1.18
Panamá	3	0.589
Perú	7	1.38
Spain	1	0.196
UK	1	0.196
United States of America	3	0.589
Uruguay	3	0.589
Venezuela	4	0.786
Sexual Orientation		
Heterosexual	429	84.3
Homosexual	13	2.553
Other	67	13.166
Education Level		
Elementary School	16	3.14
High School	95	18.7
Associate Degree	63	12.4
Undergraduate Student	143	28.1
Bachelor's Degree	80	15.7
Postgraduate Degree	112	22.0
Perceived Level of Privilege (0–9)		
High (7–9)	121	23.8
Moderate (4–6)	292	57.4
Low (0–3)	90	17.7
Other	6	1.18

Young adults 18–30 years old; adults 32–55 years old; older adults 56–98 years old; "other" for people who did not provide information on their age.

Exploratory Factor Analysis (EFA)

An exploratory factor analysis examined whether Leonard's et al. (2014) three-factor structure emerged from the current data. The Kaiser-Meyer-Olkin index indicated excellent sampling adequacy for the scale (KMO = 0.90, individual

Table 2 FAPIS Descriptive and Correlational Statistics

Items, Subscales, and Sum Score	Mean (SD)	Reliability Parameters	
		α	ω
1	4.51 (1.47)		
2	4.13 (1.69)		
3	4.47 (1.55)		
4	4.3 (1.67)		
5	4.1 (1.7)		
Honesty and Genuineness Subscale	21.5 (6.63)	0.868	0.887
6	4.34 (1.71)		
7	4.43 (1.68)		
8	4.36 (1.71)		
9	4.4 (1.75)		
Expression of Positive Feelings Subscale	17.53 (6.13)	0.916	0.933
10	3.39 (1.87)		
11	3.57 (1.9)		
12	3.35 (1.84)		
13	3.7 (1.79)		
14	3.84 (1.78)		
Hidden Thoughts and Feelings Subscale	17.85 (7.42)	0.881	0.904
FAPIS Sum Score	56.88 (14.11)	0.88	0.934

items: 0.83–0.93) and Bartlett's test of sphericity indicated that the correlation matrix did not match an identity matrix ($\chi 2$ (91) = 4437.186, $p < .001$), confirming a good data fit for factor analysis. As expected, both the screeplot and parallel analysis suggested a three-factor solution. Factors were extracted using principal axis factoring with a promax rotation that allows factors to correlate. The three factors explained 64% of the variance in participants' responses, and all factor loadings were > 0.6 (Table 3). In particular, Honesty and Genuineness items explained 22% of the variance, Expression of Positive Emotions items explained 21% of the variance, the same as Hidden Thoughts and Feelings (21%). The FAPIS subscales demonstrated significant correlations with the total score (Table 4).

Confirmatory Factor Analysis (CFA)

To assess the objective fit of the three-factor model in comparison to a single-factor model, a CFA was performed. We assessed the fit of models by examining the χ^2 Fit index, the Tucker-Lewis index (TLI), the Comparative Fit Index (CFI), the Akaike Information Criteria (AIC), the Bayesian Information Criteria (BIC), and the Root Mean Square Error of Approximation (RMSEA). After running the CFA, the three-factor model was the best model ($\Delta\chi^2(3) = 1702.4$; Table 5). Standardized factor loading estimates were strongly related to their claimed latent factors, further supporting the originally proposed three-factor model (Figure 1). Medium to large correlations were found between items corresponding to each of the three factors (Table 4).

To guarantee that participants from both recruitment methods responded in a similar way, an invariance analysis was performed. Finding provided evidence of configural (RMSEA = 0.075) and metric (RMSEA = 0.074), but

Table 3 Factor Loadings by Item for the Three-Factor Solution (N = 509)

#	Items	Factor		
		1	2	3
1	Mostré mis verdaderos sentimientos y me comporté de forma natural con esta persona.	**0.681**	0.015	0.081
2	Me sentí cómodo/a al discutir problemas significativos con esta persona.	**0.712**	0.022	-0.024
3	Me sentí cómodo/a contándole a esta persona cosas que no les cuento a otras personas.	**0.915**	0.026	-0.055
4	Le confié a esta persona mis más profundos sentimientos y pensamientos.	**0.779**	0.014	0.061
5	Le revelé a esta persona lo que considero mis defectos.	**0.690**	-0.061	0.061
6	Le expresé a esta persona mis sentimientos de amor (mi afecto) por él/ella.	0.060	0.004	**0.823**
7	Fui abierto y cariñoso con esta persona.	-0.09	0.011	**0.902**
8	Intenté acercarme a esta persona.	0.143	-0.046	**0.663**
9	Expresé a esta persona mis sentimientos hacia ella.	-0.045	0.033	**0.932**
10	Ocasionalmente no expresé mis opiniones, porque tuve miedo a cómo esta persona podría llegar a reaccionar.	0.019	**0.663**	-0.132
11	Oculté información íntima a esta persona.	-0.022	**0.784**	0.114
12	Cuando hablé con esta persona, me mantuve en temas en los que me sentí menos vulnerable.	-0.060	**0.749**	0.006
13	Hubo momentos en los que oculté información a esta persona.	-0.016	**0.851**	0.055
14	Oculté mis emociones a esta persona.	0.099	**0.731**	-0.008

Factor loadings in bold were considered for cluster interpretation. Loadings lower than 0.36 were deleted.

Table 4 Exploratory and Confirmatory Factor Analysis Correlations

	1	2	3	4
Exploratory factor analysis				
1. Honesty and Genuineness				
2. Expression of Positive feelings	0.721***			
3. Hidden Thoughts and Feelings	0.352***	0.082		
4. FAPIS sum score	0.954***	0.860***	0.421***	
Confirmatory factor analysis				
1. Honesty and Genuineness				
2. Expression of Positive Feelings	0.742***			
3. Hidden Thoughts and Feelings	0.389***	0.137**		

Computed correlation used Pearson method with listwise-deletion.
*= $p. \leq 0.05$; ** = $p \leq 0.01$; *** = $p \leq 0.001$

not scalar invariance (RMSEA = 0.077), meaning that the three-factor structure and their loadings were comparable, although with different items' intercepts, as expected. Based on these results, both samples were introduced in the analysis and treated as equivalent (Table 6).

External Criteria Validity

In order to test the external criteria validity of the FAPIS, an assessment of the correlation between the FAPIS, FIAT-R, and AAQ-II was conducted. Those measures were chosen as external criteria based on the network of interrelated therapeutic processes they evaluated. Whereas FIAT-R measures interpersonal repertoires that can hinders stablishing and maintaining intimate interactions, the AAQ-II assesses that has been found as a predictor of fear to intimacy (Maitland, 2020). All FAPIS dimensions were negatively and significantly correlated with FIAT-R subscales (Table 7). The highest negative correlation was between Hidden Thoughts and Feelings and Emotional Sensitivity. As expected, it is easier to openly communicate difficult thoughts and feelings to others when we clearly understand and manage our emotions. Furthermore, all FAPIS scales were also correlated in a negative and significant way with Social Impact (measuring people's ability to set boundaries, manage conflicts, and recognize their own needs). Likely, social situations in which people defend their own needs and status require them to share a fairly small amount of vulnerability, but not to expose their deepest emotions, thoughts, and feelings, nor to establish an intimate interaction.

Correlations between the AAQ-II and FAPIS subscales were negative and significant, which means that people who communicate their deepest feelings and thoughts and behave genuinely and honestly are less likely to avoid uncomfortable private events such as emotions, thoughts, or sensations.

In summary, negative correlations between subscales suggests that a validated version of FAPIS could be useful to predict experiential avoidance and problems in interpersonal functioning to a certain degree, considering that those aspects could imply some complexities.

Network Analysis

The structure of intimacy assessed on the scale was explored through a network analysis. A Gaussian Graphical Model (GGM) with undirected links based on the partial correlation of scale items was estimated, generating a weighted network (Figure 2). Note that the width of the edges represents the strength of the link between two items and their unique association.

Dimensionality analysis revealed network loadings (analog to factor loadings, see Golino & Christensen, 2022) along the structure identified by the factor analyses. Centrality estimates in the item level network indicated that item 3 ("I felt comfortable telling this person things that I do not tell other people") is the most central in the network, followed by items 9 and 13. It is important to highlight that each of these central items are part of one of the three factors in the scale, confirming the three-dimensional nature of the FAPIS. Item 5 (*I revealed to this person what I feel are my shortcomings*) is the least central item of this scale, alluding to how revealing one's defects in relationships is not a crucial node in connecting the intimacy network (Figure 2). Clustering coefficients for nodes were all very good, suggesting a well-connected network. However, items 6 and 8, from the Expression of Positive Emotions dimension, have the lowest clustering, indicating that they are not as well linked to the rest of the items in the scale. Lastly, stability analysis suggested an almost perfect structural consistency with the three dimensions identified (see https://osf.io/j3zpw/?view_only=1f1b629dcb9e4870ba1fe78612fa648f). Notice that this analysis was performed on cross-sectional data and thus both centrality and clustering do not imply any kind of attribution of causal status, nor a directional interpretation of theoretical preeminence.

Table 5 Fit Indices of FAPIS Models

Model	χ^2	df	χ^2/df	CFI	TLI	AIC	BIC	RMSEA	$RMSEACI_{90\%}$
Single-factor model	191.991***	77	2.49	0.581	0.505	25,131.642	25,250.151	0.216	[0.208, 0.225]
Three-factors model	217.538***	74	2.94	0.967	0 .959	23,435.269	23,566.475	0.061	[0.052, 0.071]

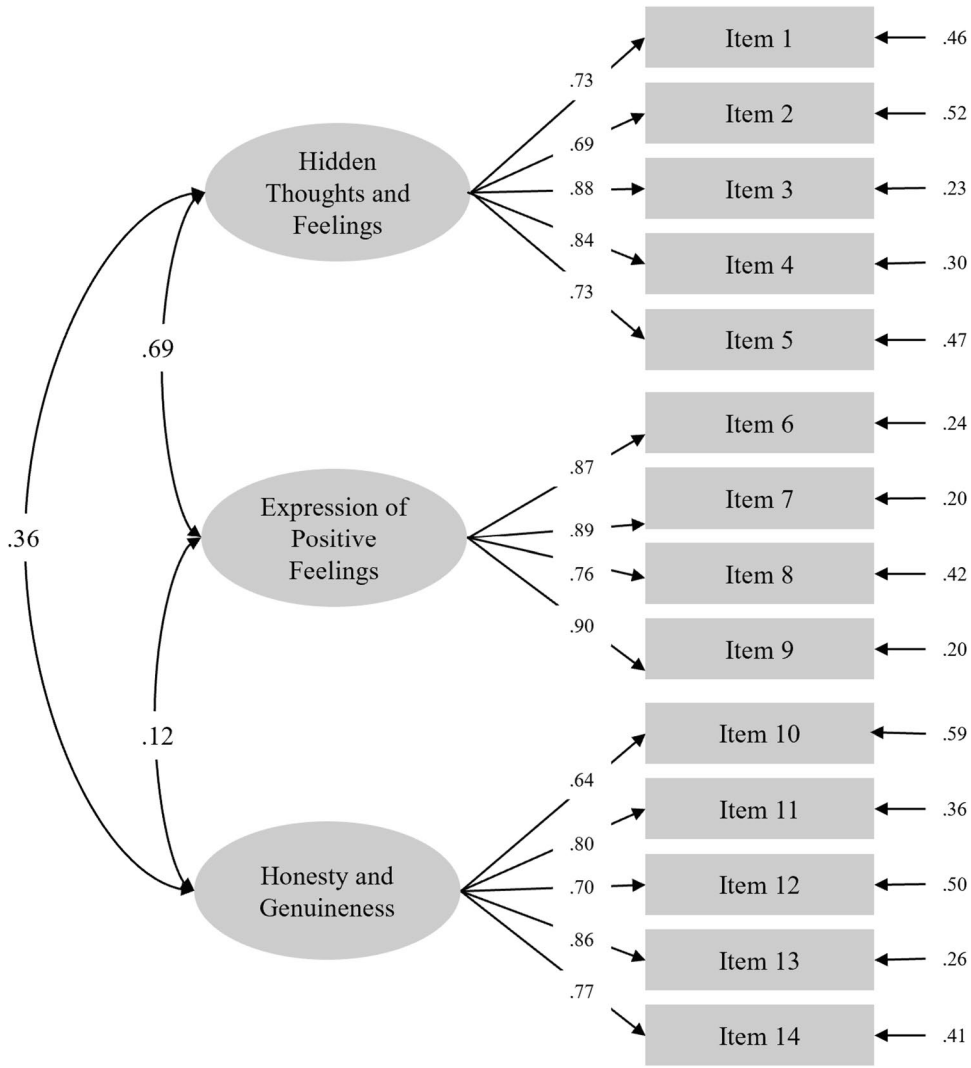

Fig. 1 Final Factor Solution for the FAPIS

Table 6 Invariance Analysis Results

Model	χ^2	df	Δdf	RMSEA	ΔRMSEA	TLI	CFI	ΔCFI	AIC	*p*
Configural	357	148		0,075		0,943	0,953		23409,88	0,000
Metric	378	159	11	0,074	-0,001	0,944	0,951	0,002	23408,83	0,000
Scalar	426	170	22	0,077	0,002	0,939	0,943	0,01	23434,71	0,000

Discussion

The present study sought to culturally adapt and validate the FAPIS to the Latin American population. EFA and CFA converged on the originally proposed 14-item scale with three subscales Hidden Thoughts and Feelings, Expression of Positive Feelings, and Honesty and Genuineness, providing evidence for a psychometrically sound factor structure. The FAPIS sum score demonstrated good to excellent internal consistency, and factor loadings were found to be strongly related to their purported latent factors, further supporting the originally proposed three-factor model.

Network Analysis offered further evidence that confirmed that the FAPIS comprises three dimensions. This analysis provided information about the most central items (3, 9, and 13) and more densely connected items. The emphasis of items 6 and 8 on romantic behaviors in intimate interactions might explain their low levels of clustering, being less connected to their neighbors in comparison to other items in the scale. Information on items centrality

Table 7 Correlations among FAPIS, AAQ-II, and FIAT-R

	AAQ-II	*FIAT-R-ES*	*FIAT-R-SI*	*FAPIS-HG*	*FAPIS-EF*	*FAPIS-HF*
AAQ-II						
FIAT-R-ES	0.560*** (0.497 0.618)					
FIAT-R-SI	0.15*** (0.070 0.241)	0.115* (0.028 0.201)				
FAPIS-HG	-0.166*** (-0.249 -0.080)	-0.240*** (-0.321 -0.155)	-0.223*** (-0.304 -0.138)			
FAPIS-EF	-0.146*** (-0.230 -0.060)	-0.178*** (-0.261 -0.091)	-0.221*** (-0.303 -0.136)	0.64*** (0.586 0.689)		
FAPIS-HF	-0.158*** (-0.241 -0.072)	-0.361*** (-0.435 -0.282)	-0.227*** (-0.309 -0.143)	0.288*** (0.206 0.366)	0.085 (-0.001 0.170)	

Computed correlation used Pearson-method with listwise-deletion; CI in parenthesis (2.5%, 97.5%)

FIAT-R-ES: FIAT Emotional Sensitivity; FIAT-R-SI: FIAT Social Impact; FAPIS-HG: Honesty and Genuineness; FAPIS-EF: Expression of Positive Feelings; FAPIS-HF: Hidden Thoughts and Feelings.

*= $p \leq 0.05$; ** = $p \leq 0.01$; *** = $p \leq 0.001$

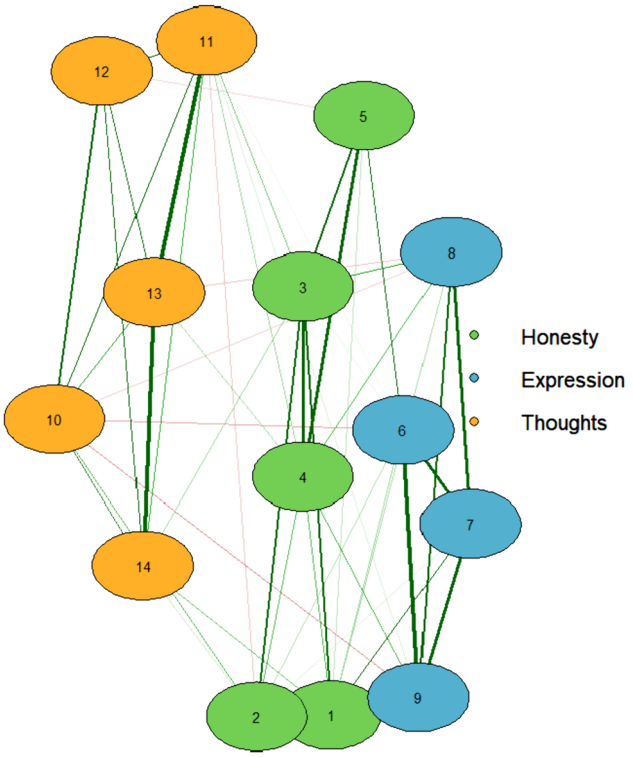

Fig. 2 Network of the FAPIS at the Item Level. *Note.* Number nodes correspond to FAPIS items numbers in Table 2

and clustering is particularly relevant for the possibility of conducting research in intimacy using longitudinal intensive designs (LID), studies that collect ongoing data (e.g., hours, days) and require a small and meaningful number of questions to evaluate constructs (Bolger & Laurenceau, 2013). Using central FAPIS items in LID would allow to identify whether intimacy patterns varied similarly within- and between-person, as well as identify possible explanatory mechanisms at the individual level that otherwise could not be explored in FAP research. In doing this, researchers should exercise care when presuming that each separate item can be seen as a distinct concept on its own and that these concepts remain consistent over time (Piccirillo et al., 2019). Clustering and item centrality are network characteristics that only make sense in the context of the cross-sectional nature of the data analyzed and thus hinder any causal or temporal interpretation (Borsboom et al 2021). For example, when administering item 9 ("I expressed my feelings about this person directly to him/her"), researchers should be cautious to not assume this is an indicator of intimacy by itself. When employing items in LID studies, it is crucial to assess their consistency in both their relationships with other items and indicators, as well as their stability over time; therefore, it is important to administer at least three-items on the same construct that allow to calculate a reliability change index (see Cranford et al., 2006).

In the assessment of external criteria validity, a negative and significant correlation between FAPIS factors and both FIAT-R subscales, Emotional Sensitivity and Social Impact, was found. On the one hand, the relation between Hidden Thoughts and Feelings (FAPIS subscale) and Emotional Sensitivity suggests that FAPIS has the ability to measure openness to sharing private events, feeling greater confidence, and less sensitivity to social criticism when expressing emotions. This was also found in Leonard's et al. (2014) FAPIS validation, in which FAPIS factors were related to fewer difficulties in people's emotional experience and expression. In line with Mirgain and Cordova's research (2007), deeper intimacy requires a major degree of emotion skills development. For instance, people who find it easy to understand their own needs, identify feelings, and communicate their emotions in an empathic way tend to display

more levels of intimacy and healthier relationships. Such findings have also been found in emotional communication research in which in close relationships facilitate emotional expression due to an ongoing history of responsiveness (Ruan et al., 2020).

On the other hand, the negative relation between FAPIS subscales and Social Impact (FIAT-R subscale) suggests that understanding one's own needs, setting boundaries, handling conflict, and discerning one's impact on others are inversely associated with the ability to establish and maintain a close relationship. Although effective conflict management, recognition of others' impacts on their own, honest and open communication, warmth and caring expressions, and other interpersonal repertoires have been identified as key behaviors of healthy relationships (Murray et al., 2021), it seems that intimate interactions focus on sharing private matters (e.g., emotions) that have been historically invalidated rather than sharing one's opinions, judgements, and boundaries. This can also be related to the low centrality of item 5, whose content is related to people's judgments of themselves. It is possible that sharing one's needs and opinions aids in facilitating interactions that focus on meeting needs (e.g., instrumental relationships), but it might interfere with those that seek to cultivate closeness (e.g., affective relationships; Sherbourne & Stewart, 1991). Future research might explore to what degree sharing our own perspective is useful in intimacy or whether these are independent repertoires whose interaction predicts healthy relationships.

All three subscales of the FAPIS were negatively and significantly correlated with experiential avoidance (AAQ-II). Previous research has found that intimacy difficulties are associated with rigid behavioral pattern, particularly avoidance of unwanted or unpleasant emotions, thoughts, and experiences (Kashdan et al., 2014; Maitland, 2020). As intimacy occurs on a continuum of interpersonal vulnerability (Cordova & Scott, 2001), it is likely that people who do not have well-developed emotion regulation skills or mainly rely emotional avoidant strategies to cope with emotionally challenge interactions are less willing to engage in intimate relationships where exposing their vulnerabilities is central (Cordova et al., 2005; Mirgain & Cordova, 2007),

This study has several limitations. Although recruitment methods aimed to collect data from a diverse population, most participants self-identified as heterosexual, women, highly educated (e.g., holding a bachelor's or postgraduate degree), and of moderate level of privilege. Although the educational characteristics of this study's sample are similar to those in the majority of the Latin American region (Valenzuela & Yáñez, 2022), level of perceived privilege, gender, and sexual orientation variables were underrepresented, limiting the external criteria validity of this FAPIS version.

The FAPIS was originally developed to assess intimacy in the context of functional analytic psychotherapy (Leonard et al., 2014). However, this study did not include a clinical sample to determine its validity in a clinical population. Future studies in the Spanish-speaking population may explore FAPIS behavior in predicting behavioral problems (e.g., depression, eating disorders) presented by diverse populations (e.g., couples, families, and sexual and gender diverse individuals) in which intimacy-related difficulties are frequently observed.

Although the results found that the FAPIS had a significant predictive validity, low correlations with experiential avoidance and the interpersonal effectiveness scale were found. In addition, there was not an assessment of FAPIS discriminative or convergent validity. It is important to study these other psychometric properties in futures studies in other to strengthens the FAPIS internal and external criteria validity when using it in Spanish-speaking populations.

Authors Contribution Conceptualization, design, and funding acquisition were performed by Amanda Muñoz-Martínez. Amanda Muñoz-Martínez, Verónica Márquez-Barraquer, and Diana Acuña-Rojas contributed to the study data collection. Data Analysis was conducted by William Jiménez Leal, Gino Marttelo Carmona Díaz, and Diana Acuña-Rojas. All authors participated in the writing, review, and editing process and approved the final manuscript.

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Data Availability The study is registered at Open Science Framework DOIhttps://doi.org/10.17605/OSF.IO/BTHGV. The raw data required to reproduce this article's findings are available at the Open Science Framework repository (Link total: https://osf.io/bthgv/?view_only=1986d0bd8aab48f0bcc05a5bf01940e5).

Declarations

Competing Interests The authors declare there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

Ethics Approval All procedures performed in this study were approved by the University de los Andes IRB (Ethics approval #1507)

Consent Informed consent was obtained from all individual participants included in the study.

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