

RESEARCH

Spanish validation of the Parental Expectations and Perceptions of Children's Sibling Relationships Questionnaire

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Funding information

This work was supported by the Agency for the Management of University and Research Grants of the Government of Catalonia (grant no. 2017SGR1681).

Abstract

Objective: To translate and culturally adapt the Parental Expectations and Perceptions of Children's Sibling Relationship Questionnaire (PEPC-SRQ; Kramer & Baron, 1995) into Spanish and test its psychometric properties.

Background: Sibling relationships contribute significantly to child development; however, to date, no study has validated an instrument to assess the quality of children's sibling relationships with Spanish samples.

Method: We conducted two studies. In Study 1, the instrument underwent translation and back-translation along with the inspection of semantic, linguistic, and contextual equivalence. In Study 2, the validity of the instrument scores was assessed by administering the translated PEPC-SRQ to 229 mothers in Spain.

Results: The Exploratory Factor Analysis revealed a two-factor structure that preserved the original 24 items. Both factors presented good internal consistency and were significantly correlated with other constructs.

Conclusion: These results support the use of the PEPC-SRQ in Spain.

Implications: The Spanish PEPC-SRQ may now be used as a tool for the early detection of conflictual relationships between siblings and as a tool for assessing the effectiveness of targeted strategies designed to bolster children's sibling relationships. Additionally, this adaptation provides the opportunity to carry out cross-cultural studies.

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KEYWORDS

cultural adaptation, exploratory factor analysis, measurement instrument, psychometric properties, sibling relationship quality, sibling rivalry, sibling warmth

The relationship between siblings is one of the most enduring relationships of an individual's life span, starting at birth and continuing until death (Relva et al., 2017). It is a unique relationship, characterized by both love and warmth as well as by conflict and rivalry (Buist et al., 2013) and contributes significantly to child development, for example, by promoting the development of social skills, social understanding, and identity formation (Ma et al., 2017). Despite the importance of this relationship, few instruments measure the quality of the relationship between siblings during the childhood and preschool years (Volling & Blandon, 2003). Most measures of sibling relationship quality are based on assessments of siblings' perceptions during adolescence (e.g., Derkman et al., 2010; Furman & Buhrmester, 1985; Relva et al., 2017; Stocker & McHale, 1992), which is not a developmentally appropriate approach for evaluating the relationship during the first years of children's lives.

Currently, no validated instrument exists in Spanish to assess parents' perceptions of sibling relationship quality during early childhood. Having a validated instrument in Spanish that reliably measures the quality of sibling relationships in early childhood is essential given the influence this relationship has on children's development and on the family system throughout the life course (Cox, 2010; Oliva & Arranz, 2005). Warm and cooperative relationships between siblings can contribute positively to children's social and emotional development, whereas hostile and aggressive sibling relationships can be a risk factor for the development of behavior problems, which can inhibit children's social competence with their peers when they enter school (Volling, 2017). Likewise, sibling relationships marked by high levels of hostility and emotional distancing have been related to poorer family interactions, including high levels of conflict and dissatisfaction between parents and differential or hostile treatment of parents toward their children. That is, the quality of fraternal relationships affects, and is affected by, the quality of other relationships within the family system (Gamble & Yu, 2014).

Early detection of sibling relationships with low warmth and elevated levels of conflict and hostility will facilitate the design of effective interventions, such as those that train parents in behavioral management techniques specifically targeting areas of need (Dirks et al., 2015). However, to accomplish this, an instrument must be available that validly and reliably assesses the quality of children's sibling relationships. In the current study, we investigated the reliability and validity of such a measure for use with Spanish mothers.

Kramer and Baron initially developed the Parental Expectations and Perceptions of Children's Sibling Relationship Questionnaire (PEPC-SRQ; Kramer, 2001; Kramer & Baron, 1995) to assess parents' perceptions of sibling relationship quality during the preschool years through early and middle childhood (from 2 to 8 years old). Three dimensions of sibling relationship quality are assessed using parents' responses to 24 items that represent a wide range of behaviors that could be exhibited between a sibling pair: (a) *Warmth*, defined as the positive aspects of sibling relationship, which may include mutual intimacy, companionship, prosocial behavior, and affection; (b) *Agonism*, defined as a set of negative interactions including conflict (i.e., mutual opposition between siblings) and forms of negative affect; and (c) *Rivalry/Competition*, defined as competition, rivalry, and jealousy.

Kramer and Baron (1995) conceptualized parents' perceptions of their children's sibling relationship quality not only as a direct measure of their observations of how well their children were getting along (i.e., the frequency of positive and negative behaviors), but also in terms of the degree to which children were behaving in ways that they desired or expected. That is, whereas many parents may expect siblings to engage in a great deal of conflict and may not be

surprised or troubled when their children behave in these ways, others may set their standards higher—for example, by expecting and desiring to see less conflict. Thus, the same level of conflict (or warmth) demonstrated by siblings in different families may evoke different reactions among parents. To capture these variations, Kramer and Baron (1995) devised a method for assessing the discrepancy between what parents expected to see in their children's interactions (their "standards") and what they report actually seeing (their "perceptions").

Thus, parents respond to the 24 PEPC-SRQ behaviors in two ways. First, parents are asked about their *standards* or expectations of their children's relationship by asking them to imagine two siblings who get along very well (and who are the same ages and genders as their children) and to rate how frequently each of the 24 behaviors might occur in this hypothetical relationship on a 5-point Likert scale (1 = *never* to 5 = *always*). Second, parents are asked about their *perceptions* of their own children's relationship during the previous 2 weeks across four domains: (a) frequency of each of the 24 behaviors in their children's relationship (1 = *never* to 5 = *always*); (b) how problematic they perceived each behavior to be (1 = *it is not a problem* to 5 = *it is a big problem*); (c) how easy it would be for them to improve each problematic behavior (1 = *very difficult* to 5 = *very easy*); and (d) how much help they would like to improve each problematic behavior (1 = *no help* to 5 = *a lot of help*). The PEPC-SRQ includes a final question in which parents are asked to rate the overall quality of their children's sibling relationship on a 7-point Likert scale (1 = *very poorly* to 7 = *extremely well*).

Kramer and Baron (1995) designed two complementary strategies to summarize these parental ratings as assessments of the quality of sibling relationships: (a) the *direct approach*, which indicates the extent to which parents report that particular behaviors occur in their children's sibling relationship (their perceptions), and (b) the *discrepancy approach*, which evaluates the degree of discrepancy between parental standards of sibling relationship and their perceptions of what actually occurs between their children, computed as the standard minus the perceived behavior. Negative discrepancy scores indicate that the observed behavior is occurring more often than the parents expect (an optimal outcome for warmth but less optimal for agonism or rivalry). Supplemental Figure 1 illustrates Kramer and Baron's (1995) original conceptual model and assessment approaches.

The psychometric properties of the instrument were tested in the original Kramer and Baron (1995) study. The factor structure of the instrument was assessed through two exploratory factor analyses (EFAs) based on mothers' and fathers' responses regarding standards for a good sibling relationship and parental perceptions of their children's actual behavior. The same three-factor structure was found for both parental standards and perceptions (Warmth = 13 items, Agonism = eight items, and Rivalry/Competition = three items). The Cronbach's alpha coefficients showed an adequate internal consistency for both standards (Warmth $\alpha = .86$; Agonism $\alpha = .88$; and Rivalry/Competition $\alpha = .81$) and perceptions (Warmth $\alpha = .86$; Agonism $\alpha = .73$; and Rivalry/Competition $\alpha = .76$). Test-retest reliability over 3 months was robust for standards (Warmth $r = .74$; Agonism $r = .86$, and Rivalry/Competition $r = .77$, all $ps < .01$), but less adequate for perceptions (Warmth $r = .71$, Agonism $r = .47$, and Rivalry/Competition $r = .37$, all $ps < .05$). Finally, significant correlations were found between the scale scores produced using the discrepancy approach and the Sibling Relationship Questionnaire (Furman & Buhrmester, 1985), which provided evidence for the convergent validity of the PEPC-SRQ as a measure of sibling relationship quality.

Although the PEPC-SRQ was originally designed to be used by U.S. parents with children aged between 14 months and 8 years, it has been used in different countries (i.e., Portugal, Canada, Australia, and Slovenia) and with parents of children of different age ranges (from 16 months to 18 years; dos Santos, 2013; Healy & Sanders, 2014; Kavčič & Zupančič, 2005; Morga-Haskiewicz, 1999). Consequently, in some studies, the instrument has been modified to fit the study population or the needs of the researchers, either by rewording or deleting some items, grouping Agonism and Rivalry/Competition into a single scale, or by deleting the

Rivalry/Competition scale (Healy & Sanders, 2014; Modry-Mandell et al., 2007; Morga-Haskiewicz, 1999; Zhu, 2018). Furthermore, to produce a shorter instrument, some researchers elected to use only the perceptions portion of the PEPC-SRQ (Binnon-Erez et al., 2018; Yu & Gamble, 2008). Although these modifications may provide researchers with a shorter measure, which may enhance the research participants' experience, one should not assume that the resulting instruments possess the same psychometric properties as the original instrument. To address this issue, some researchers have explored the reliability and validity of the modified versions of the instrument by examining its internal consistency, its correlations with other instruments, or both (Modry-Mandell et al., 2007; Yu & Gamble, 2008). However, only dos Santos (2013) reexamined the factorial structure of the instrument with a Portuguese sample, obtaining a two-factor structure (Warmth and Agonism) that overlaps but does not fully match the original three-factor structure of the instrument. This suggests that the factor structure of PEPC-SRQ may vary across cultures, for example, that Portuguese parents may make fewer distinctions between agonistic and rivalrous sibling behaviors than do U.S. parents. In the current study, we evaluated whether the responses of mothers in Spain can best be described with two versus three factors using a Spanish version of the PEPC-SRQ.

The validity and utility of any instrument that aims to measure sibling relationship quality in early to middle childhood can also be supported through its associations with other factors that have been linked in previous research with positive and negative sibling behaviors. For example, variations in children's sibling relationship quality, such as the expression of greater sibling warmth, have been linked with maternal sensitivity (Buist et al., 2017; Chen, 2020; Milevsky et al., 2011). In a sample of Dutch and Indian adolescents, Buist et al. (2017) found that more affectionate and less hostile sibling relationships were reported when mothers behaved more sensitively and directed fewer negative behaviors toward their children.

Sibling relationship quality has also been found to be associated with the level of stress individual parents report. In a study of parenting stress with mothers in China (where couples are now allowed to have a second child), Chen (2020) found that mothers' reports of parenting stress were indirectly associated with their reports of sibling relationship quality, mediated by maternal warmth, and moderated by perceptions of undermining coparenting. Thus, parenting stress tends to reduce mothers' expression of warmth to her children, which in turn is linked to less positive sibling relationships. Whereas sibling warmth has been found to be related to fewer internalizing and externalizing behavior problems, sibling conflict has been linked with more frequent behavior problems (Buist et al., 2013).

These findings are consistent with the assumptions of family systems theory (Cox, 2010; Minuchin, 1988), in which interpersonal processes occurring in other family subsystems (e.g., parent-child, spousal subsystems), as well as the individual characteristics of parents themselves, may be expected to influence (and be influenced by) dynamics in the sibling subsystem. Therefore, it is not surprising that factors external to the sibling relationship per se, such as the level of stress of individual parents experience or the difficulties in relationships mothers have with one of their children (including the bond that mothers form with their infants), have been shown to be associated with variations in sibling relationship quality (Gamble & Yu, 2014; Updegraff et al., 2005).

Thus, in the current study, we tested the extent to which mothers' reports of their own perceived stress, their children's behavior problems, and difficulties in the mother-child relationship were associated with their perceptions of the quality of their children's sibling relationship, with the aim of gathering evidence to support the validity of the Spanish version of the PEPC-SRQ. Evidence to support the validity of the PEPC-SRQ for assessing parents' perceptions of their children's sibling relationship quality would be obtained if the instrument produced a pattern of results that mirrored those obtained previously using other measures of sibling relationship quality.

In summary, the main objective of this study was to adapt culturally and test the use of the PEPC-SRQ (Kramer & Baron, 1995) with Spanish mothers. Two studies were conducted. In Study 1, we translated and culturally adapted the PEPC-SRQ to be used with Spanish mothers with

children between 2 and 7 years of age, whereas in Study 2, we examined its internal structure and reliability and sought evidence of its validity by examining the instrument's association with other constructs that have been shown in previous research to be sensitive to parents' reports of sibling relationship quality. We hypothesized that the Spanish version of the PEPC-SRQ would demonstrate adequate internal consistency and reveal an internal factor structure that was similar to that found for the original measure. Further, we hypothesized that mothers' perceptions of their children's sibling relationship on the PEPC-SRQ would be moderately correlated with their reports of their children's behavioral and emotional problems, maternal stress, and maternal bonding difficulties.

All procedures involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The study was approved by the Bioethics Commission of the University of Barcelona (IRB00003099). Informed consent was obtained from all individual participants included in the study.

STUDY 1: TRANSLATION AND CULTURAL ADAPTATION

Overview

The aim of Study 1 was to translate and culturally adapt the PEPC-SRQ into Spanish, to be used with mothers of children between 2 and 7 years of age, using a standard method to promote semantic, linguistic, and contextual equivalence with the original instrument.

Method

To adapt the English PEPC-SRQ for use with Spanish families, we followed the Brislin (1970) model and met the minimum standard recommendations of Maneesriwongul and Dixon (2004)—that is, to conduct forward translation, backward translation, followed by the monolingual pilot test of the scale. Additionally, the translation of the items from the source language of English to the target language of Spanish was not literal; rather, to achieve semantic equivalence, we adapted each item to fit the cultural context of Spain, taking into account the meaning of the words in this culture. For instance, those behaviors that in the original scale were presented as a noun, such as “threats,” “jealousy,” and “competition” in the Spanish version were translated as an action (i.e., “they threaten each other,” “they get jealous of each other,” and “they compete”). The main reasons for these changes were that they sound more natural to the Spanish speaker and avoid possible confusion derived from Spanish polysemantic nouns, such as *competencia* (“competition”), which in Spanish can mean that someone is competitive or that someone is competent to do something.

First, the original version in English was translated into Spanish independently by two of the authors of the present study (M.B. and G.L.F.), who are native speakers of Spanish, fluent in English, and were previously unfamiliar with the PEPC-SRQ. Second, the two resulting Spanish versions of the PEPC-SRQ were compared and reconciled into one forward translation. Third, the reconciled version was reviewed and approved by a third member of the team (J.G.B.). Fourth, a native English speaker, fluent in Spanish, translated this form of the PEPC-SRQ back into English. Finally, the original instrument and the back-translated English version were compared. To guarantee that the conceptual meaning was captured, the author of the original instrument was contacted and asked to rate the agreement between the original instrument and the back-translation.

The revised forward translation was tested over two rounds in a sample of 15 Spanish mothers with (only) two children aged between 2 and 10 years, recruited from the personal contacts of the researchers. Participants were contacted by email or by phone and were personally invited to

participate in Study 1. The mothers included in this pilot test were all born in Spain; they were married and had a mean age of 38.62 years ($SD = 2.82$). Most of the mothers had a college degree (80%) and were employed (93.30%) at the time of the study. Firstborn children averaged 7.37 years ($SD = 2.06$), whereas second-born children averaged 4.87 years ($SD = 2.03$). The mean age difference between siblings was 2.50 years ($SD = 0.75$). Firstborn children were mostly female (53.30%), and second-born children were predominantly male (66.70%).

In the first round, nine women were asked to rate their level of comprehension of the instructions of the PEPC-SRQ, as well as each of its items, using a 6-point Likert scale, where “0” indicated that the item was not understood at all and “5” indicated that the item was understood perfectly. Participants who rated an item lower than “5” were requested to indicate why they thought that the item was not understood perfectly and how they would improve it. The questionnaire was administered online, without a time limit.

The second round was held after incorporating the changes suggested by the participants in the first round. The nine original participants and six new participants rated their level of comprehension of the instructions and each item of the PEPC-SRQ using the same 6-point Likert scale. Again, the questionnaire was administered using an online platform and with no time limit.

Results

The original author of the PEPC-SRQ agreed with the translation of all items except the translation of Item 24, which was initially translated as “they are friendly/*se muestran amistosos*” and did not quite capture the full meaning of the word *kindness*. An alternative translation was sought that referred to both being friendly and being generous, and considerate (“they are kind to each other/*son amables el uno con el otro*”). After Item 24 was modified, the pilot test was conducted. In the first round, all items were rated as “5” by all nine participants, which indicated that they were understood perfectly; however, the instructions were rated below “5” by two participants. These participants found the instructions confusing because of how they appeared on the display on their phones, requiring them to scroll down and across to read the full text. Improvements were then made to make reading the instructions clearer on cell phone displays.

In the second round, the instructions and the 24 items were each rated as “understood perfectly” by all the participants. Thus, we considered the translation and adaptation of PEPC-SRQ to be completed. The final Spanish version is shown in Supplemental Table 1.

STUDY 2: PSYCHOMETRIC VALIDATION

Overview

The aim of Study 2 was to examine the factor structure of the translated PEPC-SRQ and its psychometric properties, including internal consistency and test–retest reliability, as well as its correlations with other measures of family processes.

Method

Participants

The participants were recruited by convenience sampling (i.e., snowball approach) through school family associations and breastfeeding and parenting support groups. A total of 229 mothers with at least two children aged between 2 and 7 years participated. Those mothers

who indicated having more than two children in this age group ($n = 13$; 5.7%) were asked to answer the questionnaires based on their two oldest children. The mothers were not financially compensated but received a personal report on their results. The sociodemographic characteristics of the participants in Study 2 are presented in Table 1.

Procedure

The study was advertised through school family associations and breastfeeding and parenting support groups throughout Spain. The study was available online beginning in February 2018 and remained open until September 2018. All participants were informed about the nature of the research and the study's objectives. It was made clear that participation was voluntary and that all data would remain confidential. Parents responded to the questionnaires online, at their convenience and without a time limit. Participants were invited to contact the research team to resolve any queries. A subsample of 89 participants agreed to participate in the test–retest reliability analysis. They were contacted by email 6 weeks after the initial assessment and asked to once again complete the PEPC-SRQ online.

Measures

The PEPC-SRQ was administered along with a series of instruments measuring psychological stress, child behavior, and maternal bonding. All these instruments have been previously adapted to Spanish with satisfactory results.

TABLE 1 Sample sociodemographic characteristics ($N = 229$)

Variables	
Maternal age, $M (SD)$	38.61 (3.73)
Maternal college degree, $n (%)$	181 (79.00)
Maternal employment status, $n (%)$	
Employed	197 (86.02)
Unemployed	32 (13.97)
Family life, $n (%)$	
Both parents and children live together	208 (90.83)
Mother and her children live with a new partner	16 (6.99)
Mother and the children live alone	5 (2.18)
Number of children in the household, $M (SD)$	2.34 (0.59)
Child age, $M (SD)$	
Older sibling	5.74 (1.44)
Younger sibling	3.10 (1.18)
Child gender, $n (%)$	
Older sibling	
Male	126 (55.02)
Female	103 (44.98)
Younger sibling	
Male	120 (52.40)
Female	109 (47.59)

The 10-Item Perceived Stress Scale (PSS-10; Cohen et al., 1983) is a self-report questionnaire designed to measure “the degree to which individuals appraise situations in their lives as stressful” (p. 385). Each of the 10 items are rated on a 5-point Likert scale (0 = *never*, 4 = *very often*). Positive items are reverse-scored, thus higher scores indicate greater perceived stress. The PSS-10 consisted of six negative and four positive items (Cohen & Williamson, 1988). The PSS-10 Spanish version has shown adequate internal consistency, test–retest reliability, and satisfactory convergent validity (Remor, 2006). In the current sample, Cronbach’s alpha coefficient was .84.

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) is a brief instrument for assessing emotional and behavioral problems in children and adolescents. The SDQ includes five scales, each with five items: Prosocial, Hyperactivity, Emotional Problems, Conduct Problems, and Peer Problems. The items are rated on a 3-point rating scale (0 = *not true*, 1 = *somewhat true*, and 2 = *certainly true*). Higher scores on the Prosocial scale reflect strengths, whereas higher scores on the other four scales reflect difficulties. Difficulties-related scales were added to generate a Total Difficulties Score (based on 20 items) with higher scores indicating more difficulties. Mothers were asked to complete the SDQ with respect to their older child.

The SDQ has been translated and validated in many languages, including Spanish. The Spanish version for children aged between 2 and 4 years and the Spanish version for those aged over 4 exhibit adequate internal consistency (Ezpeleta et al., 2013; Gómez-Beneyto et al., 2013). In the current study, both Spanish versions were used to assess older siblings’ strengths and difficulties. In our sample, the Cronbach’s alpha coefficients for the five scales and the total difficulties score were as follows: Prosocial behavior ($\alpha = .75$ for children between 2 and 4 years; $\alpha = .71$ for children older than 4 years); Hyperactivity ($\alpha = .83$ for children between 2 and 4 years; $\alpha = .84$ for children older than 4 years); Emotional Problems ($\alpha = .66$ for children between 2 and 4 years; $\alpha = .74$ for children older than 4 years); Conduct Problems ($\alpha = .72$ for children between 2 and 4 years; $\alpha = .63$ for children older than 4 years); Peer Problems ($\alpha = .67$ for children between 2 and 4 years; $\alpha = .73$ for children older than 4 years); and Total Difficulties ($\alpha = .82$ for children between 2 and 4 years; $\alpha = .88$ for children older than 4 years).

The Mother-to-Infant Bonding Scale (MIBS; Taylor et al., 2005) is an eight-item scale designed to assess the feelings of a mother towards her child (e.g., resentful, disappointed, protective). Mothers in the current study were asked to report about their bonding experiences with their older child during the previous month. Items are rated using a 4-point Likert scale (0 = *not at all*, 3 = *very much*) according to the intensity of the maternal emotion toward the child. MIBS items reflecting positive feelings toward the child are reverse scored. The maximum score is 24, with higher scores indicating more bonding challenges. The Spanish version of the MIBS (Palacios-Hernández, 2015) has been shown to have good internal consistency when administered to mothers at 12 weeks postpartum as well as with mothers of children aged 2 to 7 years (López-Fernández et al., 2021). In our sample, Cronbach’s alpha was .74.

Data analysis

Before performing the factor analyses, the suitability of the data for dimensionality analysis was determined using the Kaiser–Meyer–Olkin (KMO) value and Bartlett’s test of sphericity. Next, following the example of the original study, two exploratory factor analyses (EFAs) were performed, one on maternal standards and the other on maternal perceptions. The extraction method used, as in the original study, was unweighted least squares with orthogonal rotation (Varimax) and the extraction of three factors was forced to verify the replicability of the structure found by Kramer and Baron (1995). Only those items with factor loadings above .35 in a single factor were retained. After comparing the obtained structure with the original structure and exploring the correlations between the new factors using Pearson’s correlation coefficients, two new EFAs were performed. This time, the factors were extracted based on the results of a

scree plot with eigenvalues >1.0 (with a minimum of 5% variance per factor). The extraction method used was again the unweighted least squares method, but this time an oblique rotation (Oblimin), rather than an orthogonal rotation, was used due to the high correlations between the scales reported in the previous factor analysis. Only those items that loaded at least .35 on a single factor were retained.

The full sample ($n = 229$) and the test–retest sample ($n = 89$) were used to estimate the internal consistency (Cronbach alpha coefficients) for both standards and perceptions at two time points. Also, the test–retest reliability was assessed by Pearson’s correlation coefficient for both standards and perceptions. Finally, associations between maternal perceptions with other measures and the correlation between the discrepancy approach and the overall quality of sibling relationship were examined by calculating the Pearson correlation coefficients. All analyses were performed with the IBM SPSS 26 software.

RESULTS

Factor structure

The KMO value was .88 for standards and .87 for the perceptions, exceeding the recommended value of .60 that determines the suitability of the data set for a factor extraction (Nkansah, 2018). Bartlett’s test of sphericity reached statistical significance ($\chi^2 = 1978.83$; $df = 253$, $p < .01$ for perceptions and $\chi^2 = 1828.94$; $df = 210$, $p < .01$ for standards), supporting the adequacy of dimensionality analysis of the correlation matrix (Bartlett, 1937).

The first two EFAs (one conducted on standards and other on perceptions) with a rotated factor matrix and a forced three-factor solution explained 47.40% and 48.32% of the total variance of the standards and perceptions, respectively. The same factor structure was found in both EFAs. However, this structure did not fully match the original structure of the PEPC-SRQ. The first factor retained all the items that comprised both the original Rivalry/Competition and Agonism scales (1, 3, 5, 7, 9, 11, 13, 16, 18, 20, and 23), whereas the second (2, 4, 6, and 8) and the third (10, 12, 14, 15, 17, 19, 21, 22, and 24) factors retained the items of the original Warmth scale. All items loaded above .35 on a single factor except for Items 6 and 21, which loaded over .40 on Factors 2 and 3. On the basis of the relatively high correlations between Factors 2 and 3, which ranged from $-.326$ to $.598$ ($p < .001$), a second pair of EFAs was carried out using an oblique rotation.

Given the results of the scree plots and their eigenvalues for standards and perceptions, only two factors could be retained in the second pair of EFAs. The rotated factor matrix for two-factor solution explained the 43.27% and the 43.01% of the total variance of the standards and perceptions, respectively. In both EFAs, all items loaded .35 or higher on only one factor. The same factor structure was found in both EFAs. The first factor retained the items of the original Agonism and Rivalry/Competition scales (1, 3, 5, 7, 9, 11, 13, 16, 18, 20, and 23), whereas the second factor retained all the items of the original Warmth scale (2, 4, 6, 8, 10, 12, 14, 15, 17, 19, 21, 22, and 24). Thus, we labeled the first factor, “Agonism/ Rivalry,” and the second factor “Warmth.” The correlation between Warmth and Agonism/Rivalry was $-.316$ ($p < .01$) for standards and $-.288$ for perceptions ($p < .01$). Factor loadings for maternal perceptions and standards are presented in Table 2.

Reliability

The reliability of the PEPC-SRQ was then explored by testing the internal consistency of the two scales at the initial administration and at retest. Cronbach’s alpha coefficients for the full sample ($n = 229$) were satisfactory. For standards, Cronbach’s alpha was .883 for both Warmth and Agonism/Rivalry. For perceptions, the coefficients were .899 for Warmth and .869 for

Agonism/Rivalry. Similarly, in the retest sample ($n = 89$), Cronbach's alpha coefficients were also all satisfactory, specifically .892 for Warmth and .898 for Agonism/Rivalry (standards) and .868 for Warmth and .887 for Agonism/Rivalry (perceptions).

Test–retest reliability for maternal standards, over a 6-week period, was .462 ($p < .01$) for Warmth and .537 ($p < .01$) for Agonism/Rivalry. For maternal perceptions, test–retest reliability was .627 ($p < .01$) for Warmth and .579 ($p < .01$) for Agonism/Rivalry. These results indicate that test–retest reliability was adequate for both standards and perceptions.

Convergent validity

The correlation coefficients between maternal perceptions of sibling relationship quality on the PEPC-SRQ and the SDQ, MIBS, and PSS are reported in Table 3. Because we did not expect maternal standards to be associated with indices of actual child behavior or maternal–infant bonding, these correlations were computed using maternal perceptions only.

TABLE 2 Item loadings for PEPC-SRQ perceptions and standards ($N = 229$)

Item	Perceptions		Standards	
	Agonism/Rivalry	Warmth	Agonism/Rivalry	Warmth
1	.575	–.249	.606	–.266
2	–.242	.577	.242	.529
3	.503	–.181	– .561	–.329
4	–.189	.472	.251	.364
5	.699	–.190	– .554	–.074
6	–.277	.509	.264	.439
7	.718	–.238	– .704	–.254
8	–.117	.499	.290	.513
9	.669	–.228	– .709	–.155
10	–.058	.631	.049	.624
11	.676	–.168	– .755	–.174
12	–.074	.690	.144	.601
13	.742	–.205	– .786	–.265
14	–.158	.745	.149	.700
15	–.265	.742	.159	.730
16	.441	–.266	– .512	–.320
17	–.099	.602	.139	.753
18	.656	–.090	– .797	–.205
19	–.168	.812	.097	.782
20	.610	–.213	– .539	–.206
21	–.234	.685	.321	.742
22	–.251	.770	.238	.735
23	.495	–.029	– .526	–.040
24	–.308	.775	.295	.694
Eigenvalues	3.84	7.13	3.71	7.28
% of variance	14.33	28.67	13.96	29.31

Note: Factor loadings greater than .35 appear in bold. All analyses employed unweighted least squares extraction method and Oblimin rotation. PEPC-SRQ = Parental Expectations and Perceptions of Children's Sibling Relationship Questionnaire.

TABLE 3 Pearson correlation coefficients between PEPC-SRQ perceptions and the SDQ, PSS, and MIBS instruments ($n = 229$)

	Warmth	Agonism/Rivalry
SDQ		
Prosocial behavior	.398**	-.160*
Conduct problems	-.230**	.291**
Hyperactivity-inattention	-.225**	.170*
Peer problems	-.182*	.308**
Emotional symptoms	-.205*	.330**
Total Difficulties Score	-.287*	.304**
PSS	-.201**	.228**
MIBS	-.333**	.268**

Note: MIBS = Mother-to-Infant Bonding Scale; PEPC-SRQ = Parental Expectations and Perceptions of Children's Sibling Relationship Questionnaire; PSS = Perceived Stress Scale; SDQ = Strengths and Difficulties Questionnaire.

* $p < .05$. ** $p < .01$.

A positive correlation between mothers' perceptions of sibling Warmth and the SDQ Prosocial scale was found. Also, positive correlations were found between mothers' perceptions of sibling Agonism/Rivalry and the SDQ scales of emotional problems, conduct problems, hyperactivity-inattention, and peer problems, as well as the total difficulties score. These findings indicate that mothers who perceived their children to engage in higher levels of sibling warmth and low levels of agonism were more likely to report that their elder children demonstrated more strengths and fewer difficulties. Reciprocally, mothers who reported that their children exhibited higher levels of agonism and rivalry and lower levels of warmth also reported more emotional or behavioral problems among their elder children.

As expected, the results showed a negative correlation between the MIBS and mothers' perceptions of sibling Warmth, whereas a positive correlation was found between the MIBS and mothers' perceptions of sibling Agonism/Rivalry (see Table 3). Finally, significant correlations were also found between the PSS and maternal perceptions of sibling relationship quality on the PEPC-SRQ, with negative correlations with the Warmth scale and positive correlations with the Agonism/Rivalry scale. These results indicate that maternal perceptions of warmth, agonism, and rivalry in their children's relationship are related to their perceptions of their children's behavior, maternal bonding difficulties, and perceived stress, thereby providing evidence for the convergent validity of the PEPC-SRQ.

Finally, the discrepancy scores of Warmth and Agonism/Rivalry scales were calculated as an index of sibling relationship quality that indicates the extent to which mothers' perceptions of their children's observed behavior deviates from their standards for that behavior. The degree of the discrepancy between maternal standards and maternal perceptions of the sibling relationships was then correlated with the maternal 7-point rating of the overall quality of their children's sibling relationship. The resulting correlations were $-.380$ ($p < .01$) for Warmth and $.608$ ($p < .01$) for Agonism/Rivalry. Thus, mothers who reported that their children got along more positively also perceived that their children demonstrated greater warmth and less agonism and rivalry than they expected to see in a "good" sibling relationship.

DISCUSSION

In this article, we report the process of translating and culturally adapting the PEPC-SRQ (Kramer & Baron, 1995) into Spanish to be used with mothers of children aged 2 to 7 years.

To the best of our knowledge, this is the first time that an instrument assessing the quality of the relationship between young siblings, based on parental perceptions, has been adapted for use with Spanish populations.

In Study 1, the semantic, linguistic, and contextual equivalence between the original version and the Spanish version of the instrument was supported by the positive evaluation of back-translation by the original author of the scale. The pilot study identified limitations in the correct understanding of the instructions in the current sample, which appeared to be related to the fact that the online format of the questionnaire on some handheld devices required participants to scroll across and down to see the full display, which may have undermined their comprehension. As indicated by Buerger et al. (2019), online formats of questionnaires might slightly hinder comprehension and accurate responses (e.g., the small size of the screens could require modification of the layout of the items). However, in this study, the improvements made in the layout made the instructions more explicit, and in the second round of the pilot test, all participants indicated that they understood the instructions perfectly.

In Study 2, the factorial structure of the PEPC-SRQ was examined along with its retest reliability and convergent validity for use with Spanish families. Examining both maternal perceptions and standards, the Spanish PEPC-SRQ revealed a two-factor structure that preserved the 24 original items. The items that loaded on the Warmth scale in the original instrument loaded on the same factor in the Spanish version. However, the items that loaded on Agonism and Rivalry/Competition scales on the original instrument loaded on a single factor in our version, which we called Agonism/Rivalry. It is not surprising that the original factors of Agonism and Rivalry/Competition merged into a single factor in our study because a similar result was reported when the PEPC-SRQ was adapted for use with a Portuguese sample of parents (dos Santos, 2013).

Families in both Spain and the United States have become more diverse in their structure in recent decades, with more single-parent families, same-sex parental families, and reconstituted or blended families; fewer children; and greater equity in housework and childcare. However, cultural differences between Spanish and U.S. families continue to exist, particularly those that are linked to the specific social values that are instilled or emphasized by parents (Castro Martín & Seiz Puyuelo, 2014; Parker & Horowitz, 2015). According to Ayuso Sánchez (2017), the main values that Spanish parents tend to instill in their children are tolerance (82%), responsibility (76%), and effort toward work (62%). In contrast, Parker and Horowitz (2015) found that the values that U.S. parents emphasize when educating their children are honesty and ethics (71%), caring and compassion (65%), and hard work (62%). These subtle differences in values suggest that parents in Spain and the United States may develop different perceptions and understandings of how to best help their children become valuable members of society. Furthermore, these diverse perceptions may have implications for how Spanish and U.S. parents perceive and assess the quality of their children's relationships with siblings.

Thus, the lack of distinction among rivalry, competition, and other forms of agonistic behaviors and affects in the Spanish and Portuguese samples may arise from cultural differences between parents in these nations and those in the United States. However, this lack of distinction seems not to be exclusive to these countries. Cutting and Dunn (2006) found that mothers from the United Kingdom also did not differentiate between rivalry and other negative aspects of sibling relationships when responding to the Colorado Sibling Interview. Cross-cultural studies including U.S. and European samples are needed to assess and further understand these differences.

The two emergent scales of the PEPC-SRQ, Warmth and Agonism/Rivalry, are congruent with two (i.e., warmth and conflict) of the three dimensions of sibling relationship quality that emerge consistently in the literature (i.e., warmth, conflict, and differential treatment; Buist et al., 2013). Sibling warmth reflects positive aspects of the relationship, such as intimacy, affection, support, companionship, and closeness, whereas sibling conflict taps negative aspects such

as arguing, fighting, aggression, hostility, and coercion (Sanders, 2004). Differential treatment reflects whether children perceive that their parents behave differently with them than with their siblings, which may be manifested or expressed as sibling rivalry (Buist et al., 2013). However, this last dimension merged with the conflict dimension in the current factor analysis. In addition to the cultural difference issue described earlier, the fusion of Rivalry and Agonism in the current study could possibly be due to statistical issues, given the small number of items (three items) on the original Rivalry scale.

Furthermore, it should be noted that some authors consider that there are two basic dimensions of the sibling relationship—warmth and conflict—with rivalry/competition considered as an element of the conflict dimension (Derkman et al., 2010; Hetherington et al., 1999). For example, Derkman et al. (2010) identified two factors (Warmth/Closeness and Conflict emerging from their confirmatory factor analysis of the Sibling Relationship Questionnaire (Furman & Buhrmester, 1985). Similarly, a principal components analysis of a modified version of the Sibling Inventory of Behavior (SIB; Schaefer & Edgerton, 1981) conducted by Hetherington et al. (1999) revealed two major factors: Positivity (the sum of teaching, companionship, and empathy) and Negativity (the sum of aggression, avoidance, and rivalry). It was interesting that several of the items on the Rivalry SIB subscale (e.g., tattles on, blames when something goes wrong) were items that fell on the PEPC-SRQ Agonism scale and not the Rivalry/Competition scale, which may reflect a lack of a unified conception of the sibling behaviors that characterize agonism versus rivalry and competition. However, taken together, these previous findings with two separate instruments support a two-factor solution for describing parents' perceptions of the quality of sibling relationships.

The internal consistency of the scales of the Spanish PEPC-SRQ was satisfactory based on both maternal perceptions and maternal standards and was very similar to that obtained by Kramer and Baron (1995), Morga-Haskiewicz (1999), Kennedy and Kramer (2008), and Howe et al. (2011). However, the test–retest reliability obtained based on maternal standards was moderately lower than that obtained in the original study. Test–retest reliability based on maternal perceptions of the Spanish mothers was slightly lower for Warmth but higher for the Agonism/Rivalry scale than that obtained in the original research (Kramer & Baron, 1995); however, it was similar to the test–retest reliability obtained by Kavčič and Zupančič (2005) in Slovenia. Despite these minor differences with the original Kramer and Baron results, the test–retest reliability coefficients observed in this study were adequate and support the use of the PEPC-SRQ with mothers in Spain.

Correlational analyses were performed to test the association between the discrepancy approach of assessing overall sibling relationship quality on the PEPC-SRQ by contrasting maternal standards and perceptions, and maternal ratings of the overall quality of their children's sibling relationship. The discrepancy score for Warmth was negatively correlated with maternal ratings of sibling relationship quality, indicating that mothers who viewed their children's relationship as relatively positive also tended to indicate less of a discrepancy between their standards for warmth and affection in a good sibling relationship and their observations of their own children's relationship. Additionally, the discrepancy score for Agonism/Rivalry was positively correlated with mother's ratings of overall sibling relationship quality. These findings are congruent with those obtained by Kramer and Baron (1995), who suggested that mothers are likely to rate their children's sibling relationship as more positive when children display higher levels of warmth, and lower levels of agonism and rivalry, than what mothers expect to occur in a good sibling relationship.

To explore the validity of the PEPC-SRQ scores as a measure of maternal perceptions of sibling relationship quality, we examined the associations between the instrument and well-established indices of maternal perceived stress, child emotional and behavioral disorders, child prosocial behavior and mother-to-infant bonding difficulties, which showed low to moderate significant correlations. These findings are consistent with Modry-Mandell et al. (2007), who also found moderate to low significant associations between child behavior disorders, emotional disorders, and prosocial behavior and mothers' perceptions of sibling relationship quality using

the original PEPC-SRQ. Similarly, the magnitude of the correlations between the different scales of PEPC-SRQ based on maternal perceptions and older siblings' emotional and behavioral disorders are congruent with the results of the meta-analysis conducted by Buist et al. (2013), which reported small but significant effect sizes in the association between sibling warmth and children's internalizing and externalizing problems as well as moderate effect sizes for the association between sibling conflict and children's internalizing and externalizing problems.

Regarding maternal perceived stress and maternal bonding difficulties, this is the first study that explores their associations with PEPC-SRQ. As expected, both constructs were positively related with the Agonism/Rivalry scale and negatively associated with the Warmth scale. Furthermore, the magnitude of the association between maternal perceived stress and the Agonism/Rivalry scale is congruent with the results of Neece et al. (2012), who found significant associations, of similar magnitudes, between parental stress and child behavior problems.

It should be noted that this study has several limitations. First, this was a convenience sample, and so it may not be fully representative of the general population of Spain. Most mothers were living in a nuclear family and had a college degree; therefore, it will be important to replicate this research with families with diverse structures.

Second, fathers were not included in the study. In Spain, although men's participation in childcare has increased in recent decades, there is still a considerable difference in the time men devote to parenting compared with women. Whereas 75% of fathers spend several days a week caring for their children, 95% of mothers dedicate the same time or more, which makes mothers the main caregivers of their children (Ahrendt et al., 2018). Because differences in the time dedicated to childcare can affect parents' knowledge and perceptions of their children's sibling relationship, we decided to initially seek to validate the PEPC-SRQ only with mothers. Although Kramer and Baron (1995) did find similar factor structures of the PEPC-SRQ for both mothers and fathers, it should not be assumed that the same psychometric properties would be observed with Spanish fathers. This should be investigated in future research.

Third, although Kramer and Radey (1997) found results supportive of the convergent validity of the instrument with a U.S. sample using another instrument that measures the quality of the sibling relationship, the Sibling Relationship Questionnaire (Furman & Buhrmester, 1985), it was not possible in this study to assess the convergent validity of the PEPC-SRQ because no comparable instrument has yet been validated with a Spanish population. Additional studies with larger and more diverse samples that include parents of children of different developmental levels and that are drawn from random or representative selection are recommended. Additionally, we encourage researchers to include another well-accepted measure of children's sibling quality relationship to allow for the examination of the congruence between the two instruments. Moreover, future research evaluating the influence of sociodemographic variables in the scores (e.g., age, gender, socioeconomic status) and subsequent normative data studies are also recommended.

Even with these limitations, the results of the current study support the reliability and validity of the Spanish version of the PEPC-SRQ scores for assessing mothers' perceptions of sibling relationship quality in children aged 2 to 7 years.

Implications

The finding that the Spanish version of the PEPC-SRQ scores has satisfactory reliability and validity supports its use by Spanish-speaking family scientists as well as health care professionals for the early detection of conflictual relationships between siblings, both in practice and research settings. Early professional intervention can help improve sibling relationships and thus enhance children's social and emotional development. Additionally, this study supports

the use of the PEPC-SRQ as a tool for assessing the effectiveness of targeted strategies and interventions that are designed to bolster children's sibling relationships. For example, the PEPC-SRQ can be used as an assessment tool to evaluate pre- to post-intervention changes in children's sibling interactions. Furthermore, by examining the areas in which parents' perceptions of their children's relationship departs significantly from their standards, researchers and practitioners can design targeted prevention and intervention strategies that may lessen these discrepancies, either by helping children behave in ways that are in line with their parents' standards and expectations or by helping parents to adjust their standards and expectations in ways that may be more adaptive for the family. Additionally, this adaptation of the PEPC-SRQ provides the opportunity to compare the results obtained in Spanish-speaking samples with those obtained in other countries to carry out cross-cultural studies.

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How to cite this article: López-Fernández, G., Gómez-Benito, J., Kramer, L., & Barrios, M. (2023). Spanish validation of the Parental Expectations and Perceptions of Children's Sibling Relationships Questionnaire. *Family Relations*, 72(3), 1220–1236. <https://doi.org/10.1111/fare.12699>