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Development and Validation of the Relational Embeddedness Scale (RES) in India

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Author Note

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This study was not preregistered.

The data and analysis code are available at: https://doi.org/10.17605/OSF.IO/EU39N.

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AUTHOR'S ACCEPTED VERSION

Abstract

In collectivistic cultures, marriage represents not merely a union between two individuals but a merging of two family systems, with extended family relationships playing a role in marital satisfaction and stability. The present study developed and validated the Relational Embeddedness Scale (RES), a measure assessing extended family processes as a core determinant of marital functioning in collectivistic contexts. In a sample of 957 married individuals in India, exploratory factor analysis in a random split half (n = 455) revealed a unidimensional structure, subsequently confirmed through confirmatory factor analysis in the holdout sample (n = 502; CFI = .920, RMSEA = .062). The final 31-item scale demonstrated excellent internal consistency (α = .97) across genders, strong convergent validity with marital satisfaction (r = .61, p < .001), and good discriminant validity from social desirability (r = .06, ns). Hierarchical regression confirmed incremental validity, with the RES accounting for 36.0% additional variance in marital satisfaction beyond social desirability (β = .60, p < .001). Men reported higher levels of relational embeddedness (d = 0.17) and marital satisfaction (d = 0.24) than women, although the RES-satisfaction association did not differ significantly by gender. The unidimensional structure suggests that relational embeddedness constitutes a holistic relational experience in which in-law relationships, family support, and community integration form an integrated whole. The RES provides initial evidence of reliability and validity as an instrument for assessing family-embedded marital processes, with implications for both cross-cultural research on extended family systems and clinical work with couples in collectivistic contexts. (250 words)

Keywords: Relational embeddedness, Extended family, Marriage, Collectivistic cultures, Scale development, Cross-cultural psychology

Development and Validation of the Relational Embeddedness Scale (RES) in India

Despite growing recognition that cultural context are relevant to relationship processes, measures of marital satisfaction continue to rely predominantly on Western-developed instruments (Uhlich, Luginbuehl, et al., 2022). This raises questions about their validity for assessing relationship processes in collectivistic cultures where extended family plays a central role in marriage, and points to the need for instruments that specifically capture how marriages are embedded within broader family and community networks. One of the most widely researched dimensions of cultural variation is individualism-collectivism (Oyserman et al., 2002; Taras et al., 2010), with important implications for how intimate relationships are conceptualized and enacted across societies (Hofstede, 1984; Triandis, 1994). At its core, individualism emphasizes personal autonomy, independence, and the pursuit of individual goals, with the self understood as an entity separate from others. In individualistic cultures, marriage is primarily understood as an institution between two individuals based on romantic love and personal choice, with little family involvement (Dion & Dion, 1993; Kowal et al., 2024). Collectivism, in contrast, emphasizes interdependence, group harmony, and the subordination of individual desires to collective goals, with the self understood as relational and embedded within social networks (Markus & Kitayama, 1991). Furthermore, in collectivistic cultures marriage does not represent a union between two individuals but between two family systems (Medora, 2007), with extended family relationships influencing marital satisfaction and stability. Recent theoretical refinements reconceptualize individualism-collectivism as comprising three core facets: (1) conformity versus freedom, whereby collectivistic cultures emphasize adherence to social and family norms over individual autonomy in decisions such as partner selection and marriage, (2) exclusion versus tolerance of differences, whereby collectivistic cultures prioritize in-group cohesion and family involvement over individual preferences, and (3) discrimination versus

equality, whereby collectivistic cultures reinforce hierarchical roles based on gender and generation within family and marriage contexts, in contrast to the more egalitarian structures of more individualistic cultures (Akaliyski et al., 2026; Komisarof & Akaliyski, 2025). These facets operate at the societal level and affect relationship norms, e.g., how marriage is organized and experienced. According to these updated cultural facets, India is characterized by moderate to high collectivism (Komisarof & Akaliyski, 2025). These cultural orientations lead to differences in self-construal. Individualistic cultures foster independent self-construals emphasizing autonomy and personal goals, whereas collectivistic cultures promote interdependent self-construals prioritizing relational harmony and family obligations (Markus & Kitayama, 1991). In collectivistic cultures, these interdependent self-construals manifest in relationship contexts through emphasis on prioritization of in-group harmony over individual desires. Thus, in India, extended family involvement in marriage is normative (Sprecher & Chandak, 1992) and marital success depends not only on dyadic compatibility but also on successful integration into broader family networks (Bejanyan et al., 2015).

Despite extensive research on collectivism and family orientation (e.g., Lay et al., 1998; Triandis, 2018), existing measures focus primarily on general family connectedness rather than the specific family processes that are embedded in marital relationships in collectivistic contexts. For instance, the Family Allocentrism Scale (FAS; Lay et al., 1998), assesses individual orientation toward family but not the complex interdependencies between marriage, natal families, in-law families, and community that characterize collectivistic marriage systems. Similarly, familism measures assess general family loyalty and obligation as a cultural value (Sabogal et al., 1987) and is primarily associated with Latino cultural contexts. It does not capture the specific relational processes through which a marriage is embedded within extended family networks. Furthermore, the family cohesion and adaptability dimensions of the Circumplex Model (Olson, 2011) examine family functioning

from within (i.e., assessing how cohesive and adaptable a family is). The RES, in contrast, examines the marriage from without, namely assessing how the couple is embedded within and integrated into broader family and community networks. These represent different levels of analysis. Research with second-generation South Asian Canadians demonstrates that endorsement of family cultural values predicts preference for traditional partners and relationship orientation (Lalonde et al., 2004), highlighting the need for relationship measures that specifically capture family-level embeddedness rather than broader cultural orientations. Existing relationship research has largely drawn on Interdependence Theory (Kelley, & Thibaut, 1978; Rusbult et al., 1998), which conceptualizes marital functioning in terms of dyadic commitment, investment, and dependence between two partners. While highly influential, this framework was developed predominantly in Western, individualistic contexts and does not account for the extended family networks that are central to marital functioning in collectivistic cultures (Uhlich, Kowal et al., in press). Family Systems Theory (Bowen, 1993; Minuchin, 2018) offers an alternative framework, emphasizing that marital functioning cannot be understood in isolation from the broader family systems in which it is embedded.

In collectivistic societies such as India, the intersection of two-family systems is a defining feature of married life (Medora, 2007). Families play an active role in daily decision-making, resource allocation, and the couple's social integration into the broader community (Sprecher & Chandak, 1992). This involvement creates potential conflicts of loyalty and practical challenges across multiple domains (Singh & Shanbhag, 2025). For instance, children's education might create tension if one spouse's birth family values sending a daughter to university while the other spouse's family prioritizes early marriage. Financial obligations become complicated when the wife's birth family needs monetary support during a crisis but household resources are controlled by the marital family. Disagreements can arise over whether the wife should work outside the home or how wedding gifts and dowry should

be allocated between the families. In contexts, such as India, where patrilocal co-residence occurs these processes are intensified further, as the bride bears the primary burden of adaptation as she typically moves into her husband's established family household after marriage (Kaur et al., 2024). More broadly, however, the successful harmonization of the two-family systems constitutes a central dimension of marital life across living arrangements in collectivistic contexts. The present study addresses the absence of a psychometrically validated instrument capable of capturing these relational processes within collectivistic marriage contexts. Existing measures of marital satisfaction and family functioning were developed and validated predominantly in Western, individualistic samples (Gere & Macdonald, 2013) and do not adequately reflect the structural realities of marriage in contexts such as India, where family network integration constitutes a core dimension of marital life.

Empirical research demonstrates the centrality of extended family in Indian marriages. While nuclear families are rising, some form of joint or extended family arrangement with intergenerational co-residence remains common in India particularly in rural areas and northern states (Breton, 2021). Within these family structures, in-law relationships, especially between mothers-in-law and daughters-in-law, emerge as significant predictor of marital satisfaction (Rittenour & Kellas, 2015). Studies show negative associations between mother-in-law conflict and marital satisfaction in collectivistic societies (Wu et al., 2010), with parental interference contributing to marital instability (Singh & Shanbhag, 2025). Despite this evidence demonstrating that extended family relationships influence marital functioning in collectivistic societies, existing relationship research often relies on Western-developed measures that fail to capture important family processes including in-law relationships, family approval of the marriage, interfamily harmony, and the couple's integration into broader family and community networks. Although these dimensions are theoretically recognized as central to marital functioning in collectivistic contexts (Dion & Dion, 1993; Hamon &

Ingoldsby, 2003), they have lacked comprehensive measurement, limiting our understanding of how relational embeddedness influences couple well-being.

The present study addresses this gap by developing and validating the Relational Embeddedness Scale (RES), a new measure designed to assess relational embeddedness as experienced by married individuals in collectivistic cultures. Relational embeddedness is conceptualized as the degree to which a marriage is structurally and relationally integrated within broader family and community networks. It captures the specific ways in which the marital relationship is embedded within, supported by, and accountable to extended family systems. Unlike general collectivism measures, the RES focuses on relationship-specific family processes including satisfaction with in-law relationships, family support for the marriage, fulfillment of cultural role expectations, and community integration as a couple.

A particular methodological concern in collectivistic contexts is the potential for social desirability bias (Kim & Kim, 2016), given the high cultural value placed on family harmony and relational conformity. Individuals in collectivistic cultures may be motivated to present their family relationships and marital satisfaction in a positive light to conform to normative expectations, making it important to assess the independence of any new relationship measure from social desirability.

The Present Study

The present study aimed to develop and validate the RES in a sample of married individuals in India. The scale captures the extent to which a marriage is embedded within its familial and social community context, encompassing aspects of family relationships, social support, cultural expectations, and community belonging. To this end, we developed and validated the RES using an exploratory-confirmatory split-sample approach, addressing the following research questions and hypotheses:

RQ1: What is the factor structure of the RES in a sample of married individuals in India?

H1: The RES will demonstrate acceptable internal consistency ($\alpha \geq .70$) across the full sample and by gender.

H2: The RES will show a significant positive association with marital satisfaction, demonstrating convergent validity.

H3: The RES will show no significant correlation with social desirability, demonstrating discriminant validity from socially desirable responding.

H4: The RES will predict marital satisfaction above and beyond social desirability bias, demonstrating incremental validity.

RQ2: Do men and women differ in reported levels of family embeddedness, and does gender moderate the association between relational embeddedness and marital satisfaction?

Method

The study protocol was approved by the Institutional Review Board (IRB) at the Institute of Psychology, University of Wroclaw in Poland. Furthermore, the study procedure was conducted in accordance with the 1964 Helsinki Declaration and its later amendments. Informed consent was obtained from all participants included in the study. Sample size was determined based on established recommendations for scale development and factor analysis, with a target of at least 5-10 participants per item for both the EFA and CFA subsamples (Tinsley & Tinsley, 1987). The final sample of 957 participants provided sufficient power for the split-sample EFA-CFA approach. The EFA subsample (n = 455) yielded a subject-to-item ratio of 14.7 and the CFA subsample (n = 502) a ratio of 16.2, both exceeding this threshold

and providing adequate power for the analyses. For the CFA subsample, power was additionally confirmed using an RMSEA-based power analysis (MacCallum et al., 1996) testing close fit (RMSEA ≤ .05) against not-close fit (RMSEA ≥ .08) and yielding power of 1.00. With 31 strongly loading indicators on a single factor (M = .70), the CFA subsample (n = 502) satisfies model-based sample size requirements, as models with many indicators and strong factor loadings require smaller samples for stable parameter estimation (Wolf et al., 2013).

Participants and Procedure

Participants were recruited through the professional survey company Syno International that recruits participants through private online panels, panel networks, and social media. The survey was administered in English[1]. Compensation was provided in accordance with the survey company's standard procedures. Geographic data indicated that participants were located across multiple regions of India, including southern states (e.g., Kerala, Tamil Nadu, Andhra Pradesh), northern states (e.g., Uttar Pradesh, Delhi, Rajasthan), eastern states (e.g., West Bengal, Odisha), and western states (e.g., Gujarat), suggesting relatively broad geographic coverage across the country. A total of 1,256 responses were received. Of these, 52 were excluded as participants were not currently married, 172 failed the first attention check, and a further 75 failed the second attention check. The final sample consisted of 957 married individuals from India: 460 men (48%) and 497 women (52%). Participants who failed attention checks embedded in the survey were excluded beforehand from the final sample, ensuring data quality. The average age was 36 years (Mdn = 34, range: 19-68 years, SD = 9 years). Most participants classified their marriages as arranged (58%), as free choice/love marriage (22%) or a mix of both arranged and love marriage[2] (20%).

[1]English is one of the official languages in India (Government of India., 2015).
[2] This category reflects the increasingly common practice in India whereby couples identify their own partner but seek and obtain family approval before marriage, combining elements of both traditions (Netting, 2010).

Participants reported their current living arrangements using a checklist. Most lived with their spouse (64.4%) and children (91.9%). Living with own parents or relatives was reported by 362 participants (37.8%), while living with a partner's parents or relatives, reflecting a patrilocal arrangement, was reported by 135 participants (14.1%). The vast majority of those in patrilocal arrangements were women (n = 109, 81%). Living with one's own parents was modestly but significantly associated with higher RES scores (r = .07, p = .040), while patrilocal co-residence was not significantly associated with RES scores (r = -.05, p = .094).

Measures

Relational Embeddedness Scale (RES). The RES is a 31-item measure developed for this study to assess relational embeddedness in collectivistic marriage contexts, with the aim of capturing relational dimensions absent from Western-developed relationship measures. A theoretically guided literature review was conducted to identify relevant constructs for item development. Searches were conducted in PsycINFO and Google Scholar using combinations of search terms including 'collectivistic marriage', 'arranged marriage', 'family involvement', 'in-law relationships', 'extended family', 'family approval', and 'community integration'. We focused on empirical and theoretical literature published through 2024. Constructs were included if they met the following criteria: (a) theoretically relevant to the marital and family relationship functioning in collectivistic contexts, (b) identified in the empirical or theoretical literature on collectivistic marriage systems, and (c) not already adequately captured by existing Western relationship measures. The following content domains were identified: satisfaction with and closeness to extended family and in-law members (Hofstede, 2001; Kim et al., 2020; Rittenour & Kellas, 2015; Triandis, 1995; Wu et al., 2010), family support (Chadda & Deb, 2013), interfamily harmony (Ting-toomey & Kurogi, 1998) and family approval (MacDonald et al., 2012), family involvement in marital decision-making (Paul & Dutt, 2023; Singh & Shanbhag, 2025), fulfillment of cultural role expectations (Bejanyan et

al., 2014), and the couple's integration within their community and broader social networks (Aflatooni & Daneshpour, 2026). Items were subsequently reviewed and iteratively refined by the research team to ensure cultural relevance, conceptual coverage, and linguistic accessibility for English-speaking Indian samples. Content validity was addressed through expert review including a co-author who is an Indian national and academic based in India with firsthand knowledge of Indian family and marriage contexts, alongside scholars with expertise in Southeast Asian cultures and cross-cultural relationship research. Items were further refined empirically based on factor analytic results. Participants rate items on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Higher scores indicate greater positive relational embeddedness (see Table 1 for all items). The scale demonstrated excellent internal consistency in the current sample ($\alpha = .97$). For items referring to specific family members who may be deceased (items 3, 4, 5, 6, 27, and 28), participants were instructed to respond based on how the relationship was. Item 29 included a 'not applicable' response option for participants whose spouse has no siblings. Participants were able to skip any item they found inapplicable. Missing data were minimal, only item 29 had missing values ($n = 49$, 5.1%), with all other RES items having complete data. Missing data in the CFA were handled using full information maximum likelihood (FIML) estimation. The RES total score was computed as the mean of the 31 final items.

Relationship Assessment Scale (Hendrick, 1988). The RAS is an 8-item measure of global marital satisfaction. Items are rated on a 5-point Likert scale ranging from 1 (not at all satisfied) to 5 (extremely satisfied), with higher scores indicating greater marital satisfaction. The RAS has demonstrated good reliability (Hendrick et al., 1998). In the current sample, internal consistency was acceptable ($\alpha = .74$).

Marlowe-Crowne Social Desirability Scale - Short Form (Hamon & Ingoldsby, 2003). Social desirability bias was assessed using the 10-item short form. Items are answered

True/False (coded 1 = True, 0 = False). Total scores range from 0-10, with higher scores indicating greater tendency toward socially desirable responding. The scale demonstrated poor internal consistency in the current sample (α = .47), consistent with previous research showing reduced reliability in collectivistic cultures (Nurumov et al., 2022). Missing data on the Social Desirability Scale were negligible (*n* = 2, 0.2%).

Transparency and openness

We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study. This study was not preregistered. The data and analysis code for the confirmatory factor analysis and Fisher's r-to-z test can be obtained at: https://doi.org/10.17605/OSF.IO/EU39N.

Data Analysis Strategy

All analyses were conducted in two stages corresponding to the split-sample design. Exploratory factor analysis (EFA) was conducted on the EFA subsample (*n* = 455) using Principal Axis Factoring, which analyzes only shared variance among items and is therefore considered appropriate for identifying latent constructs (Fabrigar et al., 1999). As the EFA was conducted with a single factor forced based on theoretical expectations, no rotation was applied. Factor retention was guided by the Kaiser criterion (eigenvalue > 1) and scree plot inspection, with a cutoff of .40 for meaningful factor loadings (Ford et al., 1986). Confirmatory factor analysis (CFA) was subsequently conducted on the holdout sample (n = 502) using the MLR estimator with full information maximum likelihood (FIML) to handle missing data in R with the lavaan package (Rosseel, 2012). Model fit was evaluated using robust CFI, TLI, RMSEA, and SRMR. Reliability, validity, and gender difference analyses were conducted on the full sample (N = 957). Measurement invariance across gender was tested using a sequence of nested multigroup CFA models in lavaan.

Results

Scale Development and Psychometric Evaluation

Prior to selecting the final 31 items, we started with a 41-item measure. Initial exploratory factor analysis of all 41 items revealed that 10 negatively worded items (24%) demonstrated poor psychometric properties (factor loadings on the general factor range: -.49 to .398, all below the .40 cutoff), falling below the conventional cutoff of .40 for meaningful factor loadings (Ford et al., 1986). This is consistent with mounting evidence that reverse-coded items produce method effects and respondent confusion rather than preventing response bias (DiStefano & Motl, 2006; Schmitt & Stuits, 1985; Wong et al., 2003). All 41 initial items and their factor loadings are reported in Supplementary Table S1. Follo wing removal of these items, the final 31-item RES demonstrated excellent psychometric properties.

Factor Structure. To provide robust evidence for the factor structure of the RES, the sample was randomly split into two halves using random number generation, with the EFA conducted on the first half (n = 455) and the CFA on the second half (n = 502). Prior to conducting the EFA, sampling adequacy was verified using the Kaiser-Meyer-Olkin measure (KMO = .960, 'superb' according to Hutcheson & Sofroniou, 1999), and Bartlett's test of sphericity confirmed that correlations among items were sufficiently large for factor analysis, $\chi^2(465) = 9138.19$, $p < .001$. Exploratory factor analysis using Principal Axis Factoring on the EFA sample revealed a unidimensional structure. The first factor had an eigenvalue of 15.25, accounting for 49.2% of total variance, while the second factor had an eigenvalue of only 1.65 (5.3% variance), with all remaining factors below 1.0. The large drop in eigenvalue between the first and second factor, clearly visible in the scree plot, supported a unidimensional solution. Factor loadings ranged from .53 to .77, with a mean factor loading of .69, with all items loading strongly on the single factor.

The unidimensional structure was subsequently confirmed in the CFA holdout sample (n = 502). A single-factor model was estimated using the MLR estimator with full information maximum likelihood (FIML) to handle missing data. The initial model showed acceptable fit: robust CFI = .860, robust TLI = .850, robust RMSEA = .081 [.076, .086], SRMR = .052. Modification indices indicated theoretically defensible correlated residuals between items sharing highly similar content within the same content cluster. Specifically, we allowed correlations of residuals between items assessing closeness to spouse's mother and father (items 27 and 28), between the three community participation items (items 24, 25, and 26), and between four pairs of similarly worded items within the satisfaction and approval clusters (items 5 and 6; items 7 and 8; items 14 and 15; items 18 and 19), following standard CFA practice (Byrne, 2016). For instance, this concerned items assessing the spouse's relationship with the participant's mother and father respectively, or items assessing community standing, participation, and acceptance as a couple. These items share content that likely creates shared variance beyond the general factor of relational embeddedness. Eight correlated residuals were incorporated into the respecified model, resulting in significantly improved fit, $\Delta\chi^2(8) = 263.45$, $p < .001$. The respecified model demonstrated acceptable to good fit: robust CFI = .920, robust TLI = .912, robust RMSEA = .062 [.057, .068], SRMR = .044. All standardized factor loadings were significant and ranged from .56 to .81, with a mean factor loading of .70, confirming the unidimensional structure of the RES across both halves of the sample (see Table 1 for factor loadings).

To address the multidimensional nature of item content, we additionally tested a correlated six-factor model and a bifactor model with a general relational embeddedness factor and six content domain factors. The six-factor correlated model showed no improvement over the unidimensional model (robust CFI = .909, robust RMSEA = .067, SRMR = .047), while the bifactor model showed only marginal improvement (robust CFI =

.926, robust RMSEA = .061, SRMR = .043). However, in the bifactor model, four of the six factors (family satisfaction and support, family involvement, family approval, and cultural role expectations) showed near-zero or zero residual variances. This indicates that these content domains contribute no unique variance beyond the general relational embeddedness factor. Only community integration and closeness with family members retained small amounts of specific variance, suggesting these domains may capture some content that is partially distinct from the general factor. The minimal fit differences between models, combined with the near-zero or zero residual variances of four of the six factors in the bifactor solution, support the unidimensional model as the most parsimonious and theoretically appropriate representation of the RES.

Table 1

Final Items of the Relational Embeddedness Scale (RES; 31 items) Including Factor Loadings and Communalities from Exploratory (EFA) and Confirmatory Factor Analysis (CFA)

Item	Statement	h^2	EFA λ	CFA λ
1	I am satisfied with the support my family provides for my marriage	.440	.663	.717
2	I am satisfied with the support my spouse's family provides for my marriage	.575	.759	.712
3	I feel satisfied with my relationship with my mother-in-law	.528	.727	.707
4	I feel satisfied with my relationship with my father-in-law	.492	.701	.706
5	I feel satisfied with my spouse's relationship with my mother	.529	.727	.719
6	I feel satisfied with my spouse's relationship with my father	.451	.672	.725
7	Our extended families get along well with each other	.492	.702	.757
8	I receive adequate emotional support from my family regarding my marriage	.393	.627	.670
9	I receive adequate emotional support from my spouse's family regarding my marriage	.494	.703	.707
10	The advice and guidance we receive from our families is helpful	.446	.668	.688
11	Family members respect the boundaries of our marriage	.576	.759	.651
12	I feel comfortable with how much our families participate in important decisions	.551	.742	.753
13	My family approves of my spouse	.397	.630	.616
14	My spouse's family approves of me	.539	.734	.700
15	I feel valued and respected by my spouse's family	.582	.763	.777

Item	Statement	h^2	EFA λ	CFA λ
16	I feel like my family values and respects my spouse	.515	.717	.742
17	Both families are happy with our marriage	.586	.766	.804
18	I feel a sense of belonging in my spouse's family	.578	.760	.757
19	I believe my spouse feels a sense of belonging in my family	.482	.694	.678
20	I am satisfied with how well our marriage fulfills family and community expectations	.591	.768	.771
21	I feel fulfilled performing my role as a husband/wife according to cultural norms	.319	.565	.561
22	Our marriage brings honor to both our families	.528	.726	.774
23	I am satisfied with how we balance modern and traditional values in our marriage	.499	.706	.690
24	I feel accepted as a couple within our social community	.325	.570	.572
25	We participate appropriately in community and social functions as a married couple	.276	.526	.588
26	I am satisfied with our standing as a couple in our community	.431	.656	.649
27	I feel close to my spouse's mother	.458	.677	.720
28	I feel close to my spouse's father	.446	.668	.704
29	I feel satisfied with my relationship with my spouse's siblings	.478	.692	.643
30	I have maintained good relationships with my own family after marriage	.356	.596	.634
31	I feel emotionally connected to my extended family network	.383	.619	.680

Note. h^2 = communality from EFA subsample (n = 455); EFA λ = standardized factor loading from exploratory factor analysis (n = 455); CFA λ = standardized factor loading from confirmatory factor analysis (n = 502). Items 3–6 include parenthetical instructions for deceased family members (not shown here for brevity). All loadings significant at $p < .001$. Table displays the final 31 items retained following exploratory factor analysis. Ten negatively worded items that demonstrated poor psychometric properties were excluded. Items are rated on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Reliability RES. The RES demonstrated excellent internal consistency on the full sample (N = 957; Cronbach's α = .97) with corrected item-total correlations ranging from .55 to .77 (M = .68). The scale demonstrated similar reliability for men (α = .97) and women (α = .97). Participants reported high levels of relational embeddedness overall (M = 4.28, SD = 0.58 on a 1-5 scale), suggesting generally positive family relationships in the sample.

Convergent Validity. The RES showed strong convergent validity on the full sample (N = 957), correlating significantly with marital satisfaction (r = .61, p < .001, Table 2), indicating that greater relational embeddedness is associated with higher marital satisfaction in India. This correlation was sufficiently strong to demonstrate relevance while remaining distinct from general marital satisfaction (shared variance = 37%). Critically, when controlling for social desirability in partial correlation analyses, the association between RES and marital satisfaction remained virtually unchanged (partial r = .61, p < .001; zero-order r = .61), indicating that the observed association is not attributable to social desirability bias.

Discriminant Validity. To assess whether responses were influenced by social desirability bias, a particular concern in collectivistic contexts where family harmony is highly valued, we examined correlations with the Marlowe-Crowne Social Desirability Scale (10-item short form). The RES demonstrated good discriminant validity on the full sample (N = 957), showing virtually no correlation with social desirability (r = .06, p = .073), indicating that responses reflect family experiences rather than socially desirable responding. In contrast, marital satisfaction showed a small but significant correlation with social desirability (r = .16, p < .001), suggesting that the social desirability measure retained sufficient sensitivity to detect associations when present. Nevertheless, due to the poor reliability in our sample (α = .47), we corrected for attenuation due to measurement unreliability (Spearman, 1961), which yielded an estimated true correlation of only r = .09, supporting independence between constructs.

Table 2

Descriptive Statistics and Intercorrelations Among Study Variables

Variable	*M*	*SD*	1	2	3
1. RES Total	4.28	0.58	—		
2. RAS Total	4.21	0.59	.61**	—	
3. Social Desirability	5.85	1.79	.06	.16**	—

Note. Correlations were computed using pairwise deletion; *N* varies between 952 and 957 due to missing data on item 29 for participants whose spouse has no siblings (*n* = 49, 5.1%). RES = Relational Embeddedness Scale; RAS = Relationship Assessment Scale. **$p < .01$.

Incremental Validity. Hierarchical regression analysis confirmed that RES predicted marital satisfaction beyond social desirability bias on the full sample (N = 952; see Table 3). Social desirability accounted for only 2.6% of variance ($R^2 = .026$, $p = .001$), while RES contributed an additional 36% ($\Delta R^2 = .360$, $F(1,952) = 557.71$, $p < .001$). In the final model ($R^2 = .386$), the RES emerged as a strong predictor ($\beta = .601$, $p < .001$), with social desirability contributing a small additional effect ($\beta = .127$, $p = .001$). These results confirm that relational embeddedness meaningfully predicts marital satisfaction in Indian couples, independent of socially desirable responding.

Table 3

Hierarchical Regression Analysis Predicting Marital Satisfaction

Predictor	B	SE	β	ΔR^2
Step 1				.026**
Social Desirability	.053	.010	.126**	
Step 2				.360***
Social Desirability	.042	.008	.127*	
RES Total	.611	.026	.601***	

Note. $N = 952$. Final model: $R^2 = .386$, $F(2, 952) = 299.24$, $p < .001$. *$p < .05$, **$p < .01$, ***$p < .001$. B = unstandardized regression coefficient; SE = standard error for the unstandardized regression coefficient; β = standardized regression coefficient.

Group Differences and Scale Functioning Across Demographic Characteristics. Independent samples t-tests revealed a significant gender difference in relational embeddedness on the full sample (N = 957), $t(924.59) = 2.62$, $p = .009$, $d = 0.17$, with men reporting higher levels ($M = 4.33$, $SD = 0.54$) of RES than women ($M = 4.23$, $SD = 0.60$). A significant difference also emerged for marital satisfaction, $t(925.89) = 3.57$, $p = .001$, $d =$

0.23, with men reporting slightly higher satisfaction (M = 4.28, SD = 0.55) than women (M = 4.14, SD = 0.61). No significant difference was found for social desirability $t(951.29) = 1.27$, $p = .206$.

To test whether the association between relational embeddedness and marital satisfaction differed by gender, we conducted moderated regression analysis. Split-sample correlations showed similar associations for men (r = .589, 95% CI [.529, .644]) and women (r = .612, 95% CI [.551, .666]), and a Fisher's r-to-z test confirmed that the two correlations did not differ significantly (z = 0.54, p = .589), indicating that the strength of the association between relational embeddedness and marital satisfaction did not significantly differ between men and women. Moderated regression analysis (Table 4) confirmed this pattern, after controlling for main effects of gender and RES (Model 1: R^2 = .370), the RES × Gender interaction did not contribute significant variance (Model 2: ΔR^2 = .000, β = .015, p = .700), indicating that the strength of association did not differ significantly between men and women.

To examine whether the RES functions equivalently across genders, we tested measurement invariance on the full sample (N = 957) using a sequence of nested multigroup CFA models. The configural model confirmed that the same factor structure holds for both men and women (robust CFI = .905, robust RMSEA = .067, SRMR = .047). Constraining factor loadings to be equal across genders (metric invariance) did not significantly worsen model fit, $\Delta\chi^2(30) = 25.83$, p = .684, with no change in robust CFI. Further constraining item intercepts to be equal (scalar invariance) also did not significantly worsen fit, $\Delta\chi^2(30) = 25.66$, p = .692. Full scalar invariance was thus supported, indicating that the RES measures relational embeddedness equivalently for men and women, and that the observed mean differences reflect true differences in the construct rather than measurement artefacts.

Table 4

Moderated Regression Analysis: Gender as Moderator of RES-RAS Association

Predictor	B	SE	β	ΔR^2
Step 1				.370***
Gender	-.075	.030	-.064*	
RES (centered)	.609	.026	.599***	
Step 2				.000
Gender	-.075	.030	-.064*	
RES (centered)	.599	.038	.589***	
RES × Gender	.020	.053	.015	

Note. $N = 952$. Gender coded as 0 = Male, 1 = Female. RES centered at grand mean ($M = 4.28$). *$p < .05$, **$p < .01$, ***$p < .001$. B = unstandardized regression coefficient; SE = standard error for the unstandardized regression coefficient; β = standardized regression coefficient.

We also examined whether RES scores and the RES-RAS association differed by marriage type. A one-way ANOVA revealed no significant difference in RES scores across arranged ($M = 4.27$, $SD = 0.61$), love ($M = 4.30$, $SD = 0.51$), and mixed marriages ($M = 4.30$, $SD = 0.55$), $F(2, 953) = 0.34$, $p = .709$, $\eta^2 = .001$. However, the association between relational embeddedness and marital satisfaction was significantly stronger for arranged marriages ($r = .662$, 95% CI [.613, .707]) than for love marriages ($r = .502$, 95% CI [.393, .597]; $z = 3.01$, $p = .003$) and mixed marriages ($r = .511$, 95% CI [.399, .608]; $z = 2.77$, $p = .006$), with love and mixed marriages not differing significantly from each other ($z = -0.13$, $p = .899$).

Beyond gender and marriage type, we also examined age as another important demographic characteristic. Age was not significantly associated with RES scores ($r = -.02$, 95% CI [-.08, .04], $p = .538$), suggesting that the scale functions similarly across the age range represented in the sample.

Discussion

The present study aimed to develop and validate a measure that captures the family processes relevant to marital relationships in collectivistic settings. The 31-item RES demonstrated strong initial psychometric properties across multiple indicators in an Indian sample of 957 married individuals. The unidimensional factor structure identified in the EFA was confirmed in an independent CFA holdout sample (RQ 1). Internal consistency was excellent across genders (H1), which was further supported by full scalar measurement invariance across gender. Convergent validity with marital satisfaction was strong (H2) and discriminant validity from social desirability was demonstrated, also after correcting for measurement error (H3). Incremental validity confirmed that the RES explains unique variance in marital satisfaction beyond social desirability bias (H4). Thus, the RES provides initial evidence of reliability and validity as an instrument for assessing family-embedded marital processes in collectivistic contexts and offers an avenue for future research on how extended family processes operate within-couple functioning across cultures. While collectivistic cultures share many features in terms of family involvement in marriage, the specific ways in which relational embeddedness is experienced and expressed are likely to vary across cultural contexts. The present findings are grounded in the Indian context, characterized by the caste system as a structuring framework for marriage and community belonging, and a high prevalence of arranged marriages (Banerjee et al., 2009). Consistent with our theoretical framework, these findings demonstrate that family embeddedness, operationalized as the complex interdependencies between marriage, natal families, in-law families, and community, represents a meaningful and measurable construct that captures relationship-specific family processes.

Men reported higher levels of relational embeddedness (RQ2) than women, although gender did not moderate the RES-satisfaction association. Men also reported higher levels of

marital satisfaction than women. However, both differences were small in magnitude. This pattern likely reflects the gendered nature of family integration in Indian collectivistic contexts. Men maintain continuity with their natal families throughout marriage while women adapt to their husband's family system (Kaur et al., 2024), a process that unfolds regardless of whether couples share a household with extended family. Consistent with this interpretation, the majority of participants in our sample did not live in patrilocal arrangements, yet still navigated the relational demands of integrating two family systems. This suggests that co-residence with in-laws represents only one indicator of family involvement, and that the experience of family integration extends beyond shared households. The gender differences observed are therefore better understood as reflecting cultural-normative expectations about gendered roles in family integration rather than as a structural consequence of patrilocal co-residence per se. Men are socialized to maintain and represent natal family bonds while women are expected to subordinate their natal family ties to integrate into the husband's family system (Evans et al., 2022; Kaur et al., 2024). Beyond structural factors, traditional masculinity norms in collectivistic contexts may further contribute to this pattern, given that traditional masculine ideals in India, including duty (dharma), family authority, and the maintenance of honor (izzat) in relation to family reputation and social standing, are deeply tied to male identity in such settings (Kumar & Shikhar, 2025). Women's lower mean scores on the RES may reflect the challenges of adapting to a new family environment, navigating in-law relationships, and establishing their place within an established household structure. This pattern is consistent with theories of interdependent self-construal in collectivistic cultures (Markus & Kitayama, 1991), where men's continuity with natal families may allow for more stable relational experiences, while women's integration into husbands' families requires navigating new role expectations and hierarchies within collectivistic family systems that emphasize conformity to family expectations and hierarchical role differentiation (Akaliyski et al., 2026). The finding that men report higher marital satisfaction than women

aligns with recent evidence suggesting that men benefit more from marriage in terms of mental and physical health (Wahring et al., 2024), and a meta-analysis showing a small gender difference in marital satisfaction (Jackson et al., 2014). This pattern may be particularly pronounced in collectivistic contexts such as India, where the gendered nature of family integration creates asymmetric relational experiences for husbands and wives. Critically, however, the association between relational embeddedness and marital satisfaction did not differ across genders, with no significant moderation by gender. This suggests that while men and women may experience different absolute levels of family embeddedness, the association with marital satisfaction functions similarly for both spouses. Successful family integration matters equally regardless of whether one is maintaining existing natal family bonds (as men typically do) or adapting to a new family system (as women typically do in collectivistic Indian contexts). Measurement invariance testing confirmed that these gender differences seem to reflect differences in experienced relational embeddedness.

Furthermore, analyses by marriage type revealed that levels of relational embeddedness did not differ across arranged, love, and mixed marriages, suggesting that family integration is a normative feature of Indian married life that operates independently of how the marriage was formed. However, the association between relational embeddedness and marital satisfaction was significantly stronger in arranged marriages than in love or mixed marriages. This suggests that family integration may be more central to marital satisfaction when the marriage itself was formed through family networks. This is consistent with the theoretical argument that family embeddedness and marital functioning are more tightly connected in contexts where families play an active role in partner selection. In love marriages, by contrast, the dyadic relationship may be somewhat more autonomous from family integration, such that marital satisfaction depends to a greater extent on dyadic aspects rather than family embeddedness.

The emergence of a unidimensional structure represents a theoretically meaningful finding suggesting that the dimensions of family and community embeddedness assessed by the RES function as a coherent whole in this sample. This is consistent with our theoretical framework emphasizing that interdependent self-construals in collectivistic cultures prioritize relational harmony and family obligations as an integrated whole (Markus & Kitayama, 1991). As predicted by theories of cultural cognition, collectivistic contexts promote holistic thinking where related concepts form unified gestalts rather than analytically separable components (Nisbett et al., 2001). Thus, the unidimensional structure aligns with these theories of holistic thinking, where interdependent self-construals may lead individuals to perceive family relationships as an integrated gestalt rather than as separable components. This pattern contrasts with models developed in contexts where marriage is primarily understood as a dyadic relationship between two individuals, in which models tend to emphasize separable facets of family relationships, such as distinguishing family cohesion from family adaptability (Olson, 2011).

In summary, by moving beyond Western conceptualizations of marriage as a dyadic relationship between autonomous individuals, the RES provides cross-cultural and relationship researchers, as well as clinicians working with couples in collectivistic contexts, with a culturally grounded instrument that captures the complex interdependencies between marriage, natal families, in-law families, and community that characterize marital functioning in collectivistic contexts. For cross-cultural psychologists and relationship scientists, the scale opens new avenues for examining how relational embeddedness predicts marital satisfaction across cultural contexts. For practitioners working with couples in collectivistic contexts, the RES provides a validated tool for assessing a dimension of marital functioning that currently lacks adequate measurement in collectivistic contexts. For instance, the scale may be helpful in identifying areas of family integration that may be contributing to marital distress, develop

interventions that acknowledge the role of extended family in marriage, and help couples navigate the competing demands and loyalties that arise when two family systems intersect. However, clinical utility should be established via additional validation including clinical samples, known-groups validity, and treatment sensitivity studies before definitive recommendations can be made. The finding that relational embeddedness predicts marital satisfaction suggests that family integration may constitute an important dimension of marital well-being in collectivistic cultures. However, given the cross-sectional design, the direction of this association cannot be established, it is equally plausible that higher marital satisfaction leads couples to perceive their family relationships more positively. Longitudinal research is needed to establish the direction of this association. Nevertheless, the findings highlight relational embeddedness as a potentially important dimension for clinicians working with couples in collectivistic contexts. Therapeutic approaches focusing solely on dyadic communication and conflict resolution may miss critical determinants of marital well-being in collectivistic cultures.

Methodological Implications

The poor performance of negatively worded items in our study reflects a well-established psychometric phenomenon (DiStefano & Motl, 2006; Marsh, 1996; Schmitt & Stuits, 1985) likely involving increased cognitive load (Swain et al., 2008), acquiescence bias (the tendency to agree with statements) (Soto et al., 2008) and careless responding (Kam & Meyer, 2015). This may be amplified in collectivistic cultural contexts, where acquiescence bias and social desirability are more pronounced (Harzing, 2006; Wong et al., 2003), and where cultural norms around harmony preservation may lead participants to reject negative family characterizations regardless of their actual experiences.

Given this evidence and the poor performance in our study, we excluded reverse-coded items from the final RES. Importantly, their removal did not compromise construct coverage. The final scale's excellent discriminant validity from social desirability further demonstrates that positive item wording does not seem to reflect acquiescence bias, and attention checks rule out careless responding as an alternative explanation. The poor performance of these items thus likely reflects genuine cultural response patterns with important implications for scale development in collectivistic contexts more broadly.

Furthermore, the RES employs diverse item formats to capture different facets of relational embeddedness, including satisfaction ratings, descriptive assessments of family functioning, approval and acceptance items, and experiential items assessing closeness and belonging. Just as marital satisfaction can be understood as a valid indicator of those contexts' quality and functioning, including satisfaction items targeting central family relationships was a deliberate theoretical choice. In collectivistic contexts, satisfaction with family relationships likely indexes the experienced quality of embeddedness (i.e., the degree to which the couple feels supported by, integrated within, and positively connected to their family and community networks). In individualistic contexts, family satisfaction might be more peripheral to marital functioning. Whereas in collectivistic contexts where family integration is central to marital life, one's satisfaction with in-law relationships or family support for the marriage might constitute an indicator of how well embedded the marriage is within the family system. The strong convergent validity of the RES with marital satisfaction while maintaining discriminant validity from social desirability supports the construct validity of this approach. We acknowledge that satisfaction-phrased items may raise concerns about shared method variance inflating the RES-RAS correlation. However, several considerations suggest this correlation reflects construct overlap rather than methodological artifact. First, the RES and RAS assess satisfaction with different targets, the RES captures satisfaction with family and

community relationships surrounding the marriage, while the RAS assesses satisfaction with the dyadic relationship between partners. These are conceptually distinct constructs, one can be highly satisfied with their spouse while being dissatisfied with in-law relationships, or vice versa. Second, the shared variance between RES and RAS is 37%, meaning 63% of variance in each measure is unique. This level of overlap is consistent with convergent validity between related but distinct constructs (Campbell & Fiske, 1959). Third, if the RES-RAS correlation were primarily driven by shared satisfaction language, RES scores would be expected to correlate with any positively framed measure, including social desirability (which captures a general tendency to present oneself and one's situation favorably). The near-zero correlation between RES and social desirability (also after correcting for measurement error) therefore provides some evidence against shared method variance as the primary explanation for the RES-RAS association.

Beyond these methodological considerations, the RES represents more than a new measurement tool. It embodies a shift toward research practices that take cultural context seriously, develop instruments grounded in the lived experiences of non-Western populations, and challenge the implicit assumption that psychological constructs defined in WEIRD samples represent universal features of human relationships, when in fact such samples often represent outliers rather than the norm (Henrich et al., 2010). As the field of relationship research continues its expansion beyond Western populations (e.g., Campbell et al., 2023; Hensel et al., 2023; Uhlich, Nouri, et al., 2022), culturally grounded measurement will be essential for building a truly global understanding of how couples navigate the universal challenges of intimacy, commitment, and connection across vastly different cultural landscapes.

Limitations & Future Research

First, although the RES demonstrated virtually no correlation with social desirability, the poor reliability of the Marlowe-Crowne Social Desirability Scale in our sample limits our ability to conclusively assess discriminant validity from social desirability bias. Due to the poor reliability, the near-zero association between RES and social desirability may partly reflect measurement error rather than solely discriminant validity. This highlights a broader methodological challenge in cross-cultural research. Western-developed measures may not function equivalently across cultural contexts, ironically underscoring the rationale for developing culturally grounded instruments like the RES. Despite this limitation, the RES showed no correlation with social desirability even after correcting for measurement error, suggesting independence between constructs. Furthermore, marital satisfaction showed a small but significant correlation with social desirability, indicating that the social desirability scale retained sufficient sensitivity to detect associations when present. These findings suggest that RES responses reflect family experiences rather than socially desirable responding.

Second, the removal of all negatively worded items resulted in a scale that captures family relationship strengths. While this seems to reflect cultural response patterns, researchers wishing to assess challenging aspects of family integration should explore culturally appropriate methods that do not rely on negatively worded self-reports (e.g., through positively worded items that capture the absence of positive experiences).

Third, this is a cross-sectional study which precludes assessment of the temporal stability of the RES. Future research should examine test-retest reliability over an appropriate interval to establish whether scores remain consistent in the absence of genuine change in relational embeddedness. Additionally, validation in other South Asian collectivistic cultures

sharing similar family structures (such as Pakistan or Bangladesh) could be a next step, followed by broader validation across more culturally distant collectivistic societies such as East Asian and Latin American contexts, to examine whether the psychometric properties hold across the full diversity of collectivistic family systems.

Fourth, the sample was recruited through an online survey panel, which limits representativeness to digitally literate, likely more urban and educated segments of the Indian population. This sampling bias might be particularly relevant for the present study. Rural and less-educated populations are those most likely to live in patrilocal arrangements and experience more traditional forms of family embeddedness and are thus underrepresented here. Future research should examine the psychometric properties of the RES in more diverse samples, including rural populations and individuals with lower levels of education or limited internet access.

Fifth, the RES was completed by individual respondents which is common in relationship research. Furthermore, individual self-report is a well-established method for assessing one's perceptions of social networks (cf. ego-network approaches in social network analysis). Also, inherently dyadic constructs such as the Investment Model (Rusbult et al., 1998) are routinely assessed with only one partner. Nevertheless, future research would benefit from dyadic designs in which both spouses complete the RES, as discrepancies between partners' perceptions of relational embeddedness may themselves predict marital satisfaction. Future scale development efforts might also consider companion measures assessing family members' own perspectives on the marriage which could further complement the RES by capturing the broader family system's view of the couple. Additionally, while the RES includes parallel items covering both the respondent's own family and the spouse's family for most content domains, the closeness items (items 27 and 28) represent an exception, focusing exclusively on closeness to the spouse's parents rather than one's own

parents. Future iterations of the RES should also consider separating items that combine related but potentially distinct concepts, such as feeling valued and respected (items 15 and 16), as these may be experienced differently across cultural contexts, particularly in hierarchical family systems where pragmatic valuation and genuine respect do not necessarily co-occur. Furthermore, future work might also consider measuring financial interdependence with extended family, including resource sharing and financial obligations toward in-laws, which might be important to relational embeddedness in collectivistic contexts but is not assessed by the current items.

Sixth, the sample showed a ceiling effect on the RES, which may inflate internal consistency estimates and restrict the scale's discriminative power. However, ceiling effects are common in satisfaction-based measures (see e.g., Traut et al., 2025), particularly in samples where the measured construct such as family integration, is normatively high, as is expected in Indian collectivistic contexts where family relationships are characterized by high interdependence (Triandis, 1995). Furthermore, the high internal consistency of the RES combined with the unidimensional structure may partly reflect item redundancy, although we note that high internal consistency is by definition a function of high inter-item correlations and does not in itself indicate redundancy. The items were designed to comprehensively sample the construct domain across meaningfully distinct relationship targets and content areas. Nevertheless, future research should examine whether a shortened version of the RES performs equally well.

Seventh, some key sociodemographic variables including marital duration, income, education level and urban/rural residence were not collected, limiting our ability to characterize the sample in more detail. However, available demographic information including age, gender, marriage type, and living arrangements are reported.

Finally, the scale development did not include qualitative work such as cognitive interviewing or focus groups prior to item generation, which represents a departure from best practice recommendations in scale development (Collins, 2003). The iterative item refinement process among co-authors with cross-cultural and India-specific expertise partially served a function analogous to expert panel review. Content validity was further supported through grounding in the theoretical literature and empirical item refinement based on factor analytic results.

Another important theoretical question is whether relational embeddedness operates in individualistic cultures to a greater extent than currently recognized. While Western relationship research emphasizes dyadic autonomy and tends to treat extended family involvement as interference or boundary violation, evidence suggests that family relationships remain consequential for marital functioning even in individualistic contexts (Bryant et al., 2001). The assumption that Western marriages are purely dyadic may reflect measurement practices that fail to assess relational embeddedness rather than its genuine absence. In other words, we may not find what we do not measure. The RES thus has potential utility beyond collectivistic contexts, as a tool for examining whether and how family network integration predicts marital satisfaction across cultural settings. Cross-cultural comparisons could reveal whether relational embeddedness operates universally but has been overlooked in Western research, whether it varies in degree along a continuum rather than as a categorical divide between collectivistic and individualistic marriages, and whether the specific form it takes in India reflects broader South Asian patterns or features unique to the Indian cultural context.

Conclusion

The Relational Embeddedness Scale (RES) addresses an important gap in relationship research by providing a psychometrically validated instrument for assessing family and

community integration in collectivistic marriage contexts. Its promising initial psychometric properties, cultural grounding, and demonstrated associations with marital satisfaction suggest that relational embeddedness constitutes a meaningful and measurable dimension of marital functioning that existing Western-developed measures fail to capture. As relationship research expands beyond WEIRD samples, culturally grounded measurement tools such as the RES will be essential for building a truly inclusive understanding of how couples sustain their relationships across the full diversity of human cultural contexts.

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