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Abstract: *Triangulation is conceptualized as the involvement of a third person in a dyadic relationship in order to balance excessive conflicts, intimacy, and distance and provide stability within the system. A self-report scale to measure adolescents' triangulation into inter-parental conflicts was developed, and psychometric properties of the scale were established. The study was conducted in a three-phase format. Data was collected from adolescents (10-19 years) of different schools and colleges in Pakistan. In Phase I, items were generated through a literature review and focused group discussion. In Phase II, four latent factors (Pushed out, pulled in, mediator, balanced) were extracted through EFA (N=493). Phase III comprised a test of dimensionality, reliability, and validity. The dimensionality of the Adolescent Triangulation Scale was established through CFA (N=494). Reliability of the scale was established through Cronbach alpha ($\alpha = .87-.90$) and composite reliability (CR= .88-.92). Furthermore, the validity of the scale was assessed through Average Variance Extracted (AVE= .55-.69), Maximum Variance Shared (MVS= .88-.93), Fornell and Lacker criterion and Hetero-trait-Mono-trait Criterion. Results showed that the Adolescent Triangulation Scale appears to have good psychometric properties and contributes to the literature on family systems theory by allowing for a more nuanced measurement of triangulation than was previously available.*

Key Words: Triangulation, Pushed out, Pulled in, Mediator, Balanced, Adolescents

Introduction

In the realm of family dynamics, understanding the complexities of adolescent involvement in parental conflicts is paramount for comprehensive psychological research. This research delves into the development and validation of a novel instrument, the Adolescent Triangulation Scale (ATS), designed to meticulously measure and quantify the complex phenomenon of adolescent triangulation. Triangulation, referring to the involvement of a third party in the relationship between two others, is a concept deeply rooted in family systems theory. The scale's construction is informed by theoretical frameworks proposed by scholars such as Kerr and Bowen and Bell et al. (2001), offering a nuanced perspective on the complex roles adolescents play within familial disputes. Through a meticulous process of item development, expert evaluation, pretesting, and statistical analyses, this study presents a robust scale that not only encapsulates the multidimensional nature of adolescent triangulation but also ensures its validity and reliability. The research aims not only to provide a valuable measurement tool for future studies but also to contribute significantly to the evolving landscape of family psychology, particularly in understanding the dynamics of adolescent involvement in parental relationships.

Triangulation

Triangulation, a concept fundamental to family systems theories, refers to the process of involving a third person in the association of two others. This third person could be anyone from children, parents, grandparents, therapists, friends, or even pets (Kerr & Bowen, 1988). Early family therapy pioneers, such as Bowen, emphasized triangulation as a means to reduce anxiety in dyadic relationships by bringing in a third party.

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Types of Triangulation

Theoretical frameworks have identified various types of triangulation. Minuchin (1974) introduced detouring, where parental conflicts are redirected towards the child, and cross-generational coalitions, involving parents seeking favor from a child against the other parent. Bell et al. (2001) classified triangles in nuclear family systems into four types:

Balanced Triangle

Characterized by a reserved and identical pattern of relationships among father, mother, and adolescent. In this type, family members maintain relative distance, and parents resolve their relationship issues without involving the adolescent.

Mediator Triangle

In this form, adolescents feel caught between parents, with each parent trying to pull them towards themselves. The adolescent often feels closer to one parent than to the other.

Cross-Generational Coalition Triangle

Involves taking sides or alliances, with the adolescent feeling emotionally distant from one parent. The adolescent aligns with either the mother or the father in this type of triangle.

Scapegoating Triangle

Here, the adolescent is pushed out, and parents focus on specific aspects of the adolescent rather than addressing their own relationship issues. This type aims to protect the parental relationship from anxiety or conflict.

The Role of Adolescents in Triangulation

Adolescents, being at an age where they can comprehend and participate in inter-parental conflicts, are considered at heightened risk for being drawn into such conflicts. Their emotional maturity and communication skills make them potential targets for parental triangulation (Margolin et al., 2001; Shelton & Harold, 2008). Davies and Forman (2002) suggest that adolescents, possessing the ability to form strong alliances with parents may be more likely to be triangulated compared to younger children.

The Triangle as a Fundamental Unit

Bowen (1988) conceptualized the emotional triangle as the fundamental unit of an emotional system. Unlike psychoanalytic oedipal triangles, which focus on sexual issues, Bowen's emotional triangles explain a broader emotional process within relationships. These triangles stabilize relationships during both calm and tense times by dispersing stress and anxiety over the three corners of the triangle.

Interlocking Triangles

In families with more than three members, the concept of interlocking triangles arises. For example, in a nuclear family where a father is in conflict with both the son and daughter, the tension may indirectly affect the mother. Kerr and Bowen (1988) propose that while a fundamental triangle may suffice during calm times, increasing anxiety leads the fundamental triangle to interact with other family triangles, even at the societal level.

Conceptualization of Triangulation

Bowen (1978) posited that triangulation occurs in response to three system-level processes or interactions within families:

Inter-parental Conflict

Both overt and covert conflicts lead to triangulation. Covert conflicts, equally harmful, may drive parents to involve children in the parental dyad to resolve their issues (Bradford et al., 2019).



Lack of Differentiation of Self or Family Fusion

When self-differentiation is low, fusion increases, resulting in undifferentiated family ego masses. Triangulation emerges as a symptomatic product of spreading tension in dyadic relationships.

Parent-Child Alliances

Power struggles or alliances between a child and one parent against the other may occur due to neglect or dysfunction in the marital dyad. This type of triangulation can lead to various difficulties for the child.

Present Study

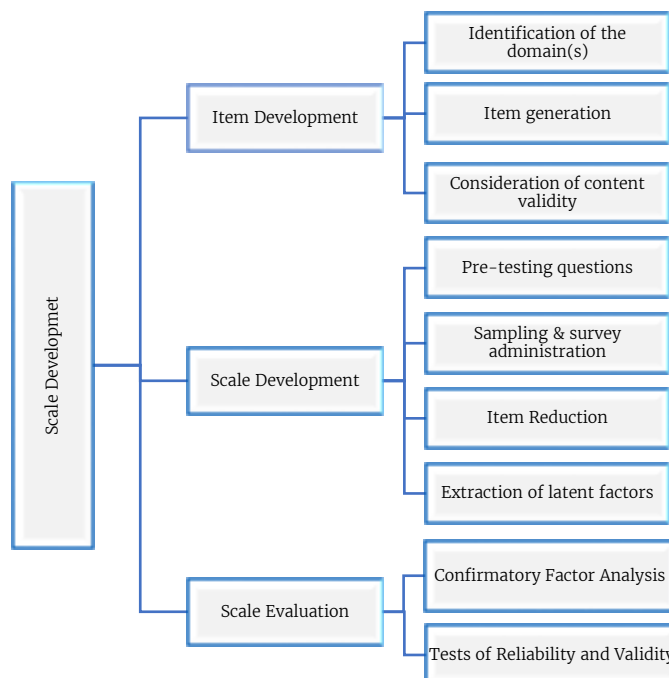
The present study aimed to develop an indigenous instrument to measure adolescent triangulation in inter-parental conflicts. The scale was developed in the native language of Urdu so that the majority of the population would understand and respond accurately. Specific objectives include the development of the indigenous Adolescent Triangulation Scale, the establishment of its factorial structure, and rigorous testing of its reliability and validity.

The rationale behind developing the Adolescent Triangulation Scale (ATS) for the Pakistani population stems from the need to investigate how adolescents in Pakistan navigate inter-parental conflicts. Triangulation, commonly understood as a third-party involvement in the relationship between two individuals, has been a topic of interest in family systems theories (Minuchin, 1974; Satir & Baldwin, 1983; Haley, 1987; Kerr & Bowen, 1988). Despite global research on triangulation, its exploration in Pakistan remains limited. Cultural norms and religious values in collectivistic Eastern societies, like Pakistan, may influence how adolescents perceive and experience triangulation differently from their counterparts in Western societies. This study aims to fill this gap by designing a valid and reliable instrument tailored to the Pakistani context (Bresin et al., 2017; Bray et al., 1984; Grych et al., 1992; Perosa et al., 1981). The development process involves a thorough literature review, focus group discussions, content analysis, and rigorous psychometric testing, ensuring cultural sensitivity and applicability to the unique dynamics of Pakistani families (Boating et al., 2018; Kohlbacher, 2005; Lawshe, 1975).

Method

The development of the adolescent's triangulation scale (ATS) is based on the guidelines outlined by Boating et al. (2018). While following this guideline, the present research aimed to develop a psychometrically sound multidimensional scale. The steps of Scale Development, as suggested by Boating et al. (2018), are as follows;

Figure 1



Phase I: Item Development

The creation of items for scale development is a critical step in the development of a reliable and valid measuring instrument. The following are the general steps in item development.

Domain Identification. Triangulation was explored by all of the main family systems theorists. However, the researcher in the current study concentrated on Bowen family systems theory (Kerr & Bowen, 1988) while establishing the Adolescent's Triangulation Scale (ATS) principally because it provides an elegant and comprehensive theory of the family system and is still presently used extensively and effectively in clinical work (Gavazzi & Lim, 2023). Before developing items, an extensive literature review regarding descriptions, examples, types, and definitions of triangulation from Bowen (1978), Kerr and Bowen (1988), Bell et al. (2001), Klever (2008), LaForte (2008), Titelman (2008) and Gavazzi and Lim (2023) was done.

Item Generation. For item generation, both deductive and inductive methods were used, as suggested by Clarke and Watson (1995). The deductive technique includes a review of the literature as well as an evaluation of current triangulation scales. The qualitative data gained from focus group discussion is used in the inductive technique.

Literature Review

At the first stage of item generation, literature regarding triangulation and its types was thoroughly reviewed. To access the literature review, updated and authentic research journals and databases were consulted (e.g., Buehler & Welsh, 2009; Buehler et al., 2009; Amato & Afifi, 2006; Franck & Buehler, 2007). Moreover, some scales/questionnaires devised to study triangulation were also approached. Possibly the most commonly used measures of triangulation are two subscales of Personal Authority in the Family System Questionnaire (PAFS-Q; Bray, Williamson, & Malone, 1984), i.e., the Intergenerational Triangulation (INTRI) and Nuclear Family Triangulation (NFTRI). However, The Triangulation subscale of Children's Perception of Inter-Parental Conflict Scale (CPIC; Grych et al., 1992), The Structural Family Interaction Scale (Perosa et al., 1981), and The Triangular Relationship Inventory (Bresin et al., 2017) were also used to measure family triangulation. All the scales were carefully assessed.

Focused Group Discussion

The primary aim of Focus Group Discussions was to explore the concept of triangulation within the Pakistani population, a novel focus in the local research culture. Four focused group discussions were conducted. The first group comprised six girls (14-18 years) from both nuclear and extended families, with a minimum education level of middle. The second group involved five boys (15-19 years) from nuclear and extended families, also with a minimum middle education level. The third group consisted of six mothers (38-49 years) from nuclear and extended families, including housewives and working women, all having completed at least their school education. The fourth group involved seven fathers (42-50 years) from nuclear and extended families, all having completed at least their school education. Participants were formally introduced to each other, and the purpose and objectives of the focus group discussions (FGDs) were clarified. A semi-structured focus group guideline was used to explore participants' perspectives on triadic relationships. The researcher served as a moderator.

Content Analysis

In order to generate codes, themes, and sub-themes, content analysis was performed. The results provide valuable insights into the dynamics of parental relationships and their impact on children, contributing to a deeper understanding of family dynamics and relationships. The concept of triangulation aligns dimensionally with Kerr and Bowen's (1988) theoretical model. The qualitative report reveals major themes, i.e., Pushed-Out, Mediator, Balancing, and Pulled-In, providing insights into parental dynamics.

The Pushed-Out theme underscores parents' child-centric focus, prioritizing children's well-being and shielding them from conflicts. The Mediator theme highlights children's active role in improving parental relationships through communication and cooperation. The Balancing theme emphasizes a parental approach to independently managing conflicts fostering a peaceful family environment. The



Pulled-In theme delves into instances where children are inadvertently involved in parental issues, exploring sub-themes like manipulation and emotional dependence. Overall, these themes contribute to a nuanced understanding of family dynamics and relationships, shedding light on the intricate interplay of parental behaviors and communication in consideration of children's well-being.

Generating Initial Item Pool

The synthesis of literature findings and FGD data led to the formulation of an initial item pool comprising 40 items, conceptualized from the four key dimensions of triangulation delineated by Bell et al. (2001): (a) balanced, (b) mediator, (c) pulled-in (cross-generational collation), and (d) pushed-out (scapegoating). This iterative process ensured that the item pool was not only theoretically grounded but also culturally relevant, setting the stage for subsequent psychometric validation.

Establishing Content Validity

To assess content validity, Lawshe's method (1975) was applied, engaging eleven specialists well-versed in family system theory, particularly triangulation. Each expert evaluated the 40 items individually, categorizing them as essential, useful but not essential, or not essential. The Content Validity Ratio (CVR) cutoff score, set at 0.63 for 11 raters, was employed. A total of 34 items, with at least eight items per theoretical domain, met the CVR criteria and were retained. Face validity was also affirmed as experts deemed all items appropriate.

Phase II: Scale Development

Scaling Method

The Adolescent Triangulation Scale utilized a five-point Likert-type scoring system aligned with the approach recommended by Krosnick and Presser (2009) to effectively capture individual response variations. Respondents provided feedback on the scale using a 5-point Likert-type format, where 1 signified strong agreement, and 5 denoted strong disagreement.

Pretesting Questions

Following item development and content validity ratio establishment, cognitive interviews with five adolescents were conducted to identify confusing or problematic questions. The feedback indicated that all 34 items in the Adolescent Triangulation Scale were succinct and easily comprehensible, with participants reporting no difficulties.

Sample

The sample for this phase comprised of 494 adolescents (boys = 230, girls = 264) aged 10 to 19 years ($M=17.65$, $SD=2.17$). The sample included students from government ($n=284$) and private ($n=210$) schools and colleges in Rawalpindi and Islamabad. A convenient sampling procedure was employed, excluding adolescents with single parents, those living independently, complete illiteracy or diagnosed with mental or physical disabilities.

Sample Suitability

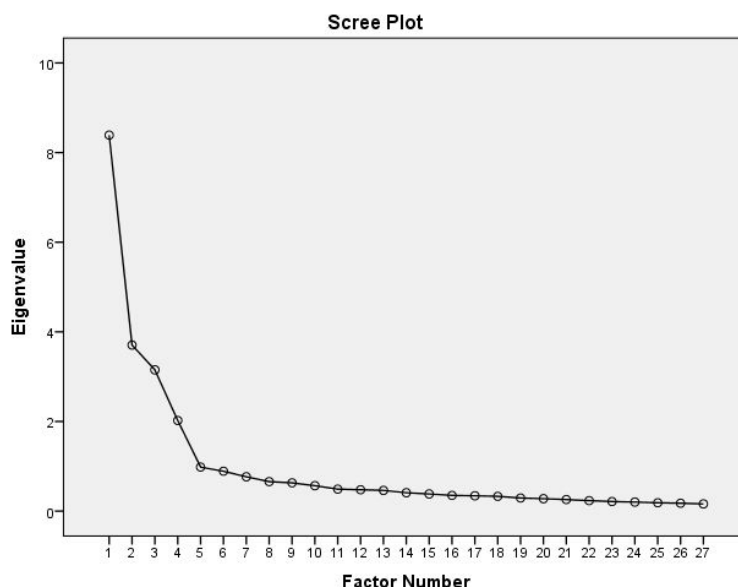
Bartlett's test of sphericity ($\chi^2(351) = 8502.54$, $p < .000$) signified the suitability for factor analysis. The Kaiser-Meyer-Olkin (KMO) value of 0.91, exceeding the recommended threshold, indicated the data's appropriateness for factor analysis.

Extraction of Latent Factors

Exploratory Factor Analysis (EFA) was conducted to unveil the factorial and dimensional structure of the 34 items. Principal-axis factoring (PAF) analysis revealed a five-factor model initially, explaining 58.73% of the total Variance. However, considering eigenvalues and a scree plot, a more condensed four-factor model was contemplated, recognizing potential adjustments to enhance the scale's precision.

Figure 2

Scree plot showing factor number and eigenvalue



Understanding the latent construct faced challenges due to disparities in interpretations between eigenvalues and the scree plot. Consequently, a meticulous evaluation of individual items became imperative for potential removal, guided by factor loadings, cross-loadings, and communality estimates. Pett et al. (2003) criteria were employed: items with factor loadings below .40 were deleted, and those with cross-loadings exceeding .32 on multiple factors were considered for removal. Seven items were eliminated, leading to a final set of 27 items. Another iteration of principal-axis factoring was conducted, revealing a four-factor model explaining 58.11% of cumulative Variance.

Factor I: Pushed-Out Triangulation

Eight items (29.72% of total Variance).

Pushed-out triangulation reflects aspects of scapegoating, where adolescents assume a pushed-out position. Moreover, measures a form of triangulation wherein parents shift attention to different aspects of the adolescent's life instead of focusing on marital conflicts.

Factor II: Mediator Triangulation

Seven items (12.41% of total Variance).

Mediator Triangulation centers around the adolescent feeling caught between parents' marital disputes. Emphasizes the adolescent's role as a middle person in parental relationships, with a maximum factor loading of .87.

Factor III: Balanced Triangulation

Five items (9.76% of total Variance).

Balanced triangulation represents a healthy relationship where parents take responsibility for their relationship problems. Emphasizes a balanced dynamic, with the highest factor loading being .78.

Factor IV: Pulled-In Triangulation

Seven items (6.19% of total Variance).

Pulled In Triangulation explains aspects of cross-generational collation, depicting an alliance between the adolescent and one parent against the other. It captures a power struggle between parents, highlighting a type of triangulation involving parental conflict.

This refined four-factor solution provides a clearer and more in-depth understanding of adolescent triangulation, addressing various dimensions within parental relationships and their impact on adolescents. Factor loading of each item on all four factors is shown in Table 1

Table 1

Factor structure of adolescent's triangulation scale: insights from EFA (N=494)

S. No	Items	F I	F II	F III	F IV
F1 pushed-out ($\alpha=.93$)					
1.	22- میرے والدین میری اچھی پرورش کے لیے اپنے تنازعات خود حل کرتے ہیں۔ P22. My Parents try to sort their conflicts themselves for my good brought-up.	.87	-.09	-.17	.00
2.	23- میرے والدین اپنے برے تعلقات کو مجھ پر اثر انداز نہیں ہونے دیتے۔ P23. My Parents do not let their bad relationships to influence me.	.78	-.11	-.16	.00
3.	21- میرے والدین اپنے تعلقات سے زیادہ میری زندگی میں دلچسپی لیتے ہیں۔ P21. My Parents take more interests in my life than their own relations.	.77	-.08	-.22	.04
4.	میرے والدین میرے مسائل کو اپنے باہمی تعلقات کے مسائل سے زیادہ اہمیت دیتے ہیں۔ P17. My parents give more head to my problems than their mutual relationship issues.	.77	-.08	-.15	.03
5.	19- میری تربیت کو برقرار رکھنے کے لیے میرے والدین بظاہر مل کر کام کرتے ہیں۔ P19. To maintain my behavior my parents apparently work together.	.77	-.07	-.19	.12
6.	30- ان کے ذاتی تنازعات کے باوجود مجھے کسی مسئلہ کا سامنا کرنا پڑتا ہے، تو میرے والدین اس مسئلہ کو حل کرنے کے لیے مل کر کام کرتے ہیں۔ P30. Despite their personal conflicts, when I face some problem, my parents tend to worked together to solve my problem.	.75	-.17	-.24	.13
7.	31- میرے والدین کا باہمی تعلق ان کے لیے میری صلاحیتوں میں دلچسپی سے کم اہم ہے۔ P31. My parents' mutual relationship is less important to them than their interest in my talents.	.68	-.18	-.21	.19
8.	34- ان کی اپنی ازدواجی زندگی کے مقابلے میں، میرے والدین اس بات سے زیادہ نگر مند ہیں کہ میری زندگی میں کیا ہو رہا ہے۔ P34. As compared to their own marital life, my parents are more concerned with what is happening in my life.	.66	-.14	-.18	.13
F II Mediator ($\alpha=.90$)					
9.	32- میرے والدین اپنے ازدواجی تنازعات کو حل کرنے کے لیے مجھ سے مشورہ لیتے ہیں۔ 32. My parents take advice from me to resolve their marital conflicts	-.10	.87	.06	-.07
10.	9- میں اپنے والدین کو الگ ہونے سے روکنے کے لیے اپنا کردار ادا کرتی آکر رہا ہوں۔ P9. I play my role to stop my parents from getting separated.	-.04	.87	.09	-.02
11.	7- میں اپنے والدین کے درمیان تنازعہ کی صورت میں ثالث کا کردار ادا کرتی آکر رہا ہوں۔ P7. I play role of a judge in case of conflict between my parents.	-.09	.82	.05	-.07
12.	24- میرے والدین اپنے ازدواجی مسائل کو حل کرنے میں میری مدد لیتے ہیں۔ P24. My Parents take my help to resolve their marital issues.	-.15	.78	.00	-.03
13.	25- جب میرے والدین ایک دوسرے سے بات نہیں کرنا چاہتے تو وہ میرے ذریعے پیغام بھیجتے ہیں۔ P25. When my parents do not want to talk to each other they communicate / send message through me.	-.15	.70	.08	.01
14.	8- میں اپنے والدین کے درمیان فاصلے کم کرنے کے لیے کردار ادا کرتی آکر رہا ہوں۔ P8. I play role to reduce distance between my parents.	-.04	.60	.08	-.10
15.	11- جب میرے والدین ایک دوسرے سے بحث کرتے ہیں تو میں ان کے درمیان ہم آہنگی برقرار رکھنے کی کوشش کرتی آکر رہا ہوں۔ P11. When my parents argue with each other I try to maintain harmony between them.	-.13	.53	.06	-.09
FIII Balanced ($\alpha=.91$)					
16.	5- میرے والدین مجھے شامل کیے بغیر اپنے ازدواجی تنازعات کو حل کر لیتے ہیں۔ P5. My parents manage their disputes without including me	-.22	.08	.78	-.20
17.	2- میرے والدین مجھے شامل کیے بغیر اپنی پریشانیوں کو حل کر لیتے ہیں۔ P2 My Parents solve their worries without including me	-.27	.12	.77	-.19
18.	6- میرے والدین مجھے ان کے درمیان بحث کا حصہ بننے کی اجازت نہیں دیتے P6 My Parents do not allow me to involve in their argumentations	-.27	.15	.76	-.09
19.	4- میرے والدین مجھے گھریلو جھگڑوں میں شامل نہیں کرتے ہیں۔ P4 My Parents do not involve me in domestic fights	-.29	.09	.75	-.02
20.	1- میرے والدین مجھے اپنے تنازعات سے الگ رکھتے ہیں۔ P1 My Parents keep me apart from their conflicts.	-.28	.04	.74	-.15
FIV pulled-in ($\alpha=.82$)					
21.	28- میرے والدین میں سے ایک تنازعات کے دوران اس کی مدد کرنے کے لیے مجھے مائل کرتی آکر رہا ہے۔ P28 One of my parents inclined me to take his/her side	.12	-.01	-.13	.70

S. No	Items	F I	F II	F III	F IV
22.	26 جب میرے والدین میں سے ایک موجود نہیں ہوتا ہے تو دوسرا اس کے بارے میں برے الفاظ استعمال کرتی کرتا ہے۔ P26 When one of my parents is not present the other used bad words about him/her.	-.08	-.08	-.04	.68
23.	27 میرے والدین مجھے ان کے خراب تعلقات کے بارے میں ایک دوسرے کے جذبات کے بارے میں جاننے کے لیے استعمال کرتے ہیں۔ P27 My parents used me to learn about one another's feelings regarding their bad relationship.	.05	.03	-.08	.66
24.	14 میرے والدین ایک دوسرے پر انحصار کرنے کی بجائے جذباتی مدد کے لیے مجھ پر انحصار کرتے ہیں۔ P14 My parents depend on me for emotional support instead of depending on each other.	-.02	-.02	-.12	.66
25.	15 میں تنازعہ کی صورت میں اپنے والدین میں سے ایک کا ساتھ دیتا ہوں۔ P15 I be with one of my parents in case of dispute.	.15	-.13	.00	.59
26.	13 لڑائی کی صورت میں، مجھے اپنے والدین میں سے ایک کی حمایت کرنے پر مجبور کیا جا رہا ہے۔ P13 In case of fight, I am forced to support one of my parents.	.09	-.1	-.02	.57
27.	12 جب میں اپنے والدین میں سے ایک کے قریب جاتا ہوں تو میں دوسرے سے دوری محسوس کرتا ہوں۔ P12 When I get close to one of my parents I feel distant from the other.	.14	-.03	-.15	.47

Note. The scale was originally developed in the Urdu language, and an un-standardized translation was provided here for the purpose of understanding

Table 1 shows the factor loading of all the items on the same scale as well as the cross-loading on another scale. The ATS demonstrated good overall internal consistency ($\alpha = .73$) with strong coefficient alphas on the pushed-out (.93), mediator (.90), balanced (.91), and pulled-in (.82) factors.

Phase III: Scale Evaluation

Confirmatory Factor Analysis. Confirmatory Factor Analysis (CFA) is employed to assess the construct validity of the Adolescent's Triangulation Scale (ATS). This robust statistical approach tests a predetermined factor structure aligned with the theoretical framework.

Sample and Procedure

Confirmatory factor analysis was performed on data obtained from 493 adolescents (229 boys, 264 girls) aged 10 to 19 ($M = 17.65$, $SD = 2.17$). Participants were purposively sampled from schools in Rawalpindi and Islamabad, Pakistan. Excluded those from single-parent households, living independently, illiterate, or with mental/physical disabilities. Questionnaires were administered with permission, and ethical standards were maintained, ensuring voluntary participation and informed consent. Confidentiality measures were strictly upheld. The collected data underwent thorough Confirmatory Factor Analysis (CFA) using AMOS 22, following a structured approach for efficient analysis. To test the dimensionality of the Adolescent Triangulation Scale (ATS), a series of CFAs on the 27 retained items was conducted, utilizing maximum likelihood estimation. Modification indices guided the application of error co-variance to enhance model fit. The identification of the factor model involved examining factor loadings, variances, and co-variances among factors, as well as errors.

Sample Suitability

The initial data preparation involved a meticulous evaluation, ensuring the dataset's integrity for Confirmatory Factor Analysis (CFA). Inter-item correlation analysis indicated no significant singularity or multicollinearity issues, with correlations ranging from .01 to .75. The determinant of the correlation matrix surpassed 0.000001, eliminating concerns of multicollinearity. A KMO measure of .91 and a significant Bartlett's test ($\chi^2 = 10544.36$, $df = 276$, $p < 0.001$) supported the dataset's suitability for factor analysis. Consequently, the data was deemed fit for CFA, aligning with established standards for robust structural equation modeling.



First Order CFA

The first-order Confirmatory Factor Analysis (CFA) of the Adolescent Triangulation Scale involved testing the predefined factor structure through statistical methods. The analysis utilized a 27-item pool to test the ATS four subscales measurement model, and all items were allowed to load on their specified factor as suggested by the results of EFA.

Table 2

Chi-square, degree of freedom, and stepwise model fit indices of adolescent triangulation scale first order CFA (N=493)

Models	χ^2	p	df	Fit Indices						
				χ^2/df	GFI	TLI	CFI	NFI	RMSEA	RMR
1	1248.19	.000	318	3.92	.81	.91	.92	.89	.07	.07
2	700	.000	243	2.88	.88	.95	.95	.93	.06	.06

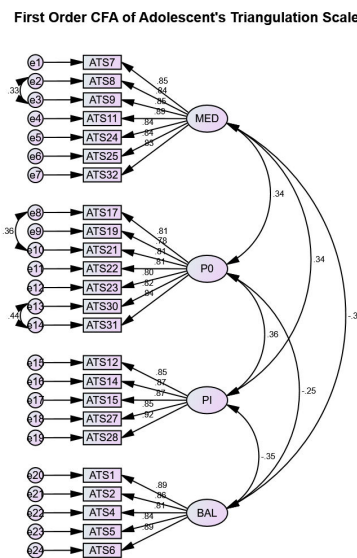
Note. CFI = Comparative Fit Index, GFI = goodness-of-fit index, TLI = Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation

Table 2 shows that the chi-square values for ATS were significant for initial model 1 as well as modified model 2. However, Bentler (2007) suggested that with a large sample size, the chi-square test's assumptions give an inaccurate probability. Therefore, the decision of model fit was made on goodness of fit indices other than chi-square. Results reveal that model 1, i.e., an initial test of the ATS shows a poor fit: ($\chi^2 = 1248.19$, $df = 318$, CFI = .92, RMSEA = .07, SRMR = .04). In order to fit the model, all items were inspected for standardized regression weights. As Hulland (1999) and Henseler et al. (2012) suggested, all the items whose standardized factor loading falls between .40 and .70 should be considered for deletion. Therefore, item no. 34 (factor loading = .63) and 13 (factor loading = .68) were deleted. Furthermore, item no. 26 was also deleted, as suggested by the modification index. Standardized factor loadings from this model are shown in Table 3.

However, mild revisions were also done with the help of error co-variances. Based on the suggestion of modification indices and content overlapping, error co-variance was added to the error terms of the same general factor. This was done to get an excellent fit. Our revised model showed a considerably enhanced fit indices ($\chi^2 = 700$, $df = 243$, CFI = .95, RMSEA = .06, SRMR = .03).

Figure 2

First-order CFA of adolescent's triangulation scale



Note. ATS = Adolescent's Triangulation Scale, BAL= Balanced Triangulation, PI = Pulled-In Triangulation, PO = Pushed-Out Triangulation MED = Mediator Triangulation

Second Order CFA of Adolescent Triangulation Scale

Second-order confirmatory factor analysis is used to interpret ATS as multi-level and multidimensional by combining its four dimensions, namely pushed-out, pulled-in, Mediator, and Balanced triangulation, under the umbrella of a common higher-level factor, namely adolescent triangulation, into inter-parental conflicts. Table 3 shows the chi-square degree of freedom and model fit indices for ATS second-order CFA.

Table 3

Goodness of fit indices for adolescent triangulation scale second-order CFA model (N=493)

Models	χ^2	df	Fit Indices						
			χ^2/df	GFI	TLI	CFI	NFI	RMSEA	RMR
1	886.13	248	3.57	.93	.93	.93	.91	.07	.07
2	685.84	244	2.81	.95	.95	.95	.93	.06	.06

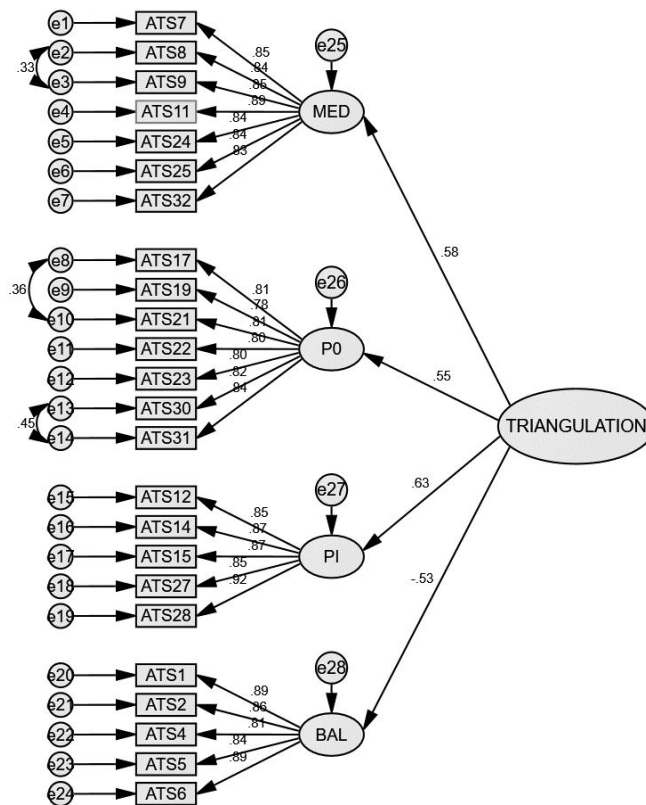
Note. GFI = goodness-of-fit index, CFI= Comparative Fit Index, RMSEA= Root Mean Square Error of Approximation, TLI = Tucker-Lewis Index

Table 3 shows that fit indices met the pre-established criterion values and indicated an excellent model fit for the observed data. The second-order factor model yielded the following fit statistics, $\chi^2 = 685.84$, $df = 244$, $\chi^2 / df = 2.81$, CFI = .95, TLI = .95, RMSEA = .06 (95% CI: 0.056 - 0.070), SRMR = .03. All the standardized factor loading i.e. regression weights (β) estimates contributed significantly to the measurement of their factors ($p < .01$). Results of second order CFA suggested that the hypothesized model of ATS fitted well.

Figure 3

Second-order CFA of adolescent's triangulation scale

Second Order CFA of Adolescent's Triangulation Scale



Note. ATS = Adolescent's Triangulation Scale, BAL= Balanced Triangulation, PI = Pulled-In Triangulation, PO = Pushed-Out Triangulation MED = Mediator Triangulation



Indicators Reliability

The indicator's reliability is assessed through standardized regression weight and squared multiple correlations of all the items of the adolescent's triangulation scale. Table 4 shows the factor loading and R² for all 24 items retained after the CFA model fit.

Table 4
Standardized regression weight and R² of ATS for CFA (N=493)

Items	Standardized Regression Weight	r ²	Items	Standardized Regression Weight	r ²
Pushed-out			Pulled-in		
ATS17	.81***	.65	ATS12	.85***	.72
ATS19	.78***	.61	ATS14	.87***	.73
ATS21	.81***	.64	ATS15	.87***	.76
ATS22	.81***	.64	ATS27	.83***	.72
ATS23	.80***	.66	ATS28	.92***	.85
ATS30	.82***	.67			
ATS31	.84***	.70			
Mediator			Balanced		
ATS7	.84***	.71	ATS1	.87***	.78
ATS8	.84***	.70	ATS2	.86***	.74
ATS9	.85***	.72	ATS4	.81***	.66
ATS11	.88***	.78	ATS5	.83***	.70
ATS24	.83***	.70	ATS6	.88***	.78
ATS25	.83***	.70			
ATS32	.83***	.69			

Note. ATS = Adolescent's Triangulation Scale, ***p < .001.

Results in Table 4 show that factor loading (λ) is well above the cutoff score of .70. and is significant at a 5% level of significance. Results indicate that each item's dependability was high, which supports the placement of each item on the designated latent construct. The R² values for ATS items range from moderate to high, i.e., .61 to .85.

Internal Consistency, Convergent and Discriminant Validity of ATS

In order to assess internal consistency, convergent and discriminant validity of the newly developed Adolescent Triangulation Scale, Cronbach alpha, composite reliability, average Variance extracted, Mean Shared Variance, MaxR(H), and HTMT were computed and reported in Table 5.

Table 5
Composite reliability (CR), the average Variance extracted, the square root of the average variance extracted (AVE) (in bold), and correlations between constructs (off-diagonal) (N=493)

Factors	α	CR	AVE	MSV	MaxR(H)	I	II	III	IV
I MED	.89	.94	.71	.11	.94	.84	(.33)	(.34)	(.31)
II PO	.90	.92	.65	.12	.93	.33***	.80	(.35)	(.25)
III PI	.87	.94	.76	.12	.94	.34***	.35***	.87	(.35)
IV BAL	.88	.93	.73	.12	.93	-.31***	-.25***	-.35***	.85

Note. MED = Mediator Triangulation, PO = pushed-out triangulation, PI = pulled-in triangulation and BAL = Balanced Triangulation

Cronbach alpha and composite reliability are commonly used to assess an instrument's internal consistency. Results in Table 5 show that the value of coefficient alpha ranged between .90 and .92, whereas the values of CR ranged between .92 and .94. The values of both parameters are well above the suggested cutoff values. Therefore, all the four subscales are considered to have good internal consistency. MaxR (H) values were also observed to be greater than the values of CR and hence provide a piece of evidence for

construct validity. Average Variance Extracted is used to report the convergent validity of ATS. Results show that the value of AVE for all four subscales is well above the suggested cutoff value, i.e., $AVE > .50$. The value of AVE ranged between .65 to .76. The Value of CR is also well above the suggested cutoff point, i.e., $CR > .60$.

Furthermore, the discriminant validity is evaluated by using the Fornell and Larcker (1981) criterion as well as the cross-loading of indicators. Results show that all the items have factor loading greater than .70 on their respective factor. The cross-loading of all the items on other factors is less than .40 and hence fulfills this criterion of inclusion in the final scale. In Table 5, values in parenthesis present the HTMT ratio of correlation between two constructs: given as .35 (Pushed-out & pulled-in); .33 (Pushed-out & mediator), .25 (Pushed-out & balanced) .34 (Pulled-in & mediator); .35 (Pulled-in & balanced), .31 (mediator & balanced). As a result, all of the HTMT values are less than 85, indicating that the constructs are distinct and discriminant validity may be stated to have been demonstrated.

Discriminant validity is also proven by taking AVE values larger than the relevant maximum shared variance (MSV) into account. (Hair et al., 2014). Results showed that the values of AVE for all three constructs are greater than their respective MSV and hence provide more evidence for discriminant validity. The result shows that Fornell-Lackers criterion of discriminant validity was also satisfactory as the correlations among all latent constructs are smaller than the square root of each construct's AVE. Furthermore, Results show that CR for all subscales of ATS are above .70 and the AVE values are within .64 and .73. Overall, discriminant validity can be accepted for this measurement model.

Discussion

The research investigates adolescent triangulation in inter-parental conflicts, a concept often overlooked in family systems theories. Triangulation involving a third person in a relationship has received theoretical attention, but quantitative assessments are scarce. Notably, Bresin et al. (2017) and others have explored triangulation globally, yet Pakistan, with its distinct cultural norms, remains largely unexplored. The study seeks to bridge this gap by creating a reliable instrument tailored to the Pakistani context. Anticipating cultural differences, the research acknowledges that Pakistani adolescents may experience triangulation differently than their counterparts in more individualistic societies. This study addresses the dearth of measurement tools, aiming to enhance understanding in a cultural context where taboos and collectivistic norms shape interpersonal dynamics. The research underscores the need for culturally sensitive instruments in exploring adolescent triangulation.

In order to attain the above-mentioned objectives, the study was conducted in three different phases, as suggested by Boating et al. (2018). It started with item development by getting detailed information about "triangulation" (Buehler & Welsh, 2009; Buehler et al., 2009; Amato & Afifi, 2006; Franck & Buehler, 2007) that was aimed to be operationalized in the present study. As the first step of the scale development, pertinent literature about the concept of triangulation was thoroughly reviewed. This review of the literature helped the researcher develop focused group guidelines for the exploration of the triangulation phenomenon as experienced by adolescents. By taking into account the main viewpoints extracted from previous literature, the researcher was able to develop clear, easy, simple, short, and open-ended questions about adolescent triangulation. Four focus group discussions were conducted with adolescents and parents in this phase of the present study. After conducting the FGDs, the researcher was able to screen salient information about the fundamental aspects of adolescent triangulation. In the next step, the obtained data were transcribed using a simple transcription method by Kuckartz et al. (2014).

After transcribing the data, content analysis, following Kohlbacher's (2005) guidance, was applied, providing a comprehensive insight into adolescent triangulation. The results revealed that a majority of adolescents experienced involvement in inter-parental conflicts. Some positioned themselves as mediators, acting as an anchor to maintain parental connections, while others felt compelled to take sides under parental pressure. Interestingly, some adolescents perceived themselves as the focal point, receiving undivided attention from parents who seemed to forget their conflicts. Additionally, opinions varied, with some parents and adolescents suggesting that parental issues could be resolved without involving children. Based on these findings, a 40-item pool was generated to measure triangulation, expressed in clear Urdu language. The items underwent rigorous review by eleven experts from psychology departments at

Rawalpindi Women's University and International Islamic University, Islamabad, ensuring the validity and reliability of the developed instrument. Lawshe's method (1975) was employed to assess content validity. Eleven experts evaluated items for clarity, conciseness, reading comprehension, face, and content validity. Their recommendations led to refining the initial 40 items, retaining 34 with excellent content validity and substantial face validity.

The second phase involves the scale development. Before the initial tryout, a cognitive interview was done with five adolescents to identify if any item was confusing, problematic, or difficult to answer. All 34 items were found to be straightforward and comprehensible. After finalizing the item pool, the scale was administered on a purposive, convenient sample of 494 adolescents. Data collected from this sample were subjected to descriptive statistics and factor analysis for the assessment of their psychometric properties and factorial structure. To assess the factorability of a correlation matrix of the scales, many well-established criteria were utilized, including Kaiser's criterion approach, principal-axis factoring (PAF) analysis, and Cattle's scree test. All variables that were loaded on various factors measured distinct constructs. The rotational factor pattern defined a basic structure with strong loadings on one factor and modest loadings on the other factors. Because of low factor loadings or cross-loading, 7 of the 34 Adolescent Triangulation Scale items were eliminated based on EFA.

The 27 retained items demonstrated communalities exceeding three, forming a cohesive four-factor solution reflecting pushed-out, pulled-in, mediator, and balanced triangulation. These findings underscored the Adolescent Triangulation Scale's (ATS) validity and reliability. The instrument supported a four-factor structure aligning with established triangular typologies. The final ATS, comprising at least four items per subscale, ensured a balanced representation of the sub-dimensions. Additionally, the alpha coefficients, exceeding .80 for ATS and its subscales, signaled satisfactory internal consistency. This robust validation process solidified the ATS as a dependable tool for assessing adolescent triangulation in inter-parental conflicts. The adolescent Triangulation Scale (ATS) has 27 items and is comprised of four subscales, i.e., pushed-out, pulled-in, mediator, and balanced. Total triangulation scores were obtained by reverse scoring the items of balanced triangulation, i.e., item no. 1-5.

To confirm the factorial structure of the scale developed through EFA, first and second-order Confirmatory Factor Analysis (CFA) was conducted on a new sample of 493 participants. The initial first-order CFA, testing the four-factor solution suggested by EFA, showed a poor fit. To enhance the model fit, items were scrutinized for standardized regression weights. Following suggestions by Hulland (1999) and Henseler et al. (2012), items with standardized factor loadings between .40 to .70 were considered for deletion. Consequently, items 34, 13, and 26 were eliminated based on these criteria and recommendations from modification indices and the committee. Mild revisions were made using error co-variances, guided by modification indices and content overlapping. Error co-variances were added to the same general factor to achieve an excellent fit. The revised model demonstrated significantly improved fit indices, supporting a robust four-factor structure according to the first-order factor analysis. Deleted items, along with their unstandardized English translation, follow;

ان کی اپنی ازدواجی زندگی کے مقابلے میں، میرے والدین اس بات سے زیادہ فکر مند ہیں کہ میری زندگی میں کیا ہو رہا ہے۔ Item 34

Item 34. My parents are more concerned with what is happening in my life than their own relationship

لڑائی کی صورت میں، مجھے اپنے والدین میں سے ایک کی حمایت کرنے پر مجبور کیا جا رہا ہے۔ Item 13

Item 13. In case of conflicts, I have to support one of my parents.

جب میرے والدین میں سے ایک موجود نہیں ہوتا ہے تو دوسرا اس کے بارے میں برے الفاظ استعمال کرتا ہے۔ Item 26

Item 26. When one of my parents is not present, the other uses bad words about him/her

The second order CFA was performed with the remaining 24 items of ATS. Second-order CFA was done to determine the total construct of triangulation. The balanced subscale has a negative association with total scores, whereas pushed-out, pulled-in, and mediator triangulation has a positive association with ATS total. Furthermore, the internal consistency of the ATS total, as well as all the subscales, was within the satisfactory range. Factor loading and squared factor loadings were above the minimum cutoff point, indicating the indicator's reliability. Composite and Cronbach reliability was also above the minimum

acceptable range, indicating excellent internal consistency of the newly developed scale. Moreover, average Variance extracted (AVE), Fornell and Larcker criterion, Heterotrait-Monotrait (HTMT) correlation ratio, and maximum shared Variance suggested good convergent and discriminant validity of ATS.

Limitations and Suggestions

The study on scale development for measuring adolescent triangulation into inter-parental conflicts exhibits a few limitations. Firstly, the research was conducted in a specific cultural context (Pakistan), limiting the generalizability of the findings to diverse cultural settings. Additionally, the reliance on self-report measures introduces the potential for response bias. Future studies could benefit from incorporating more diverse samples and employing a multi-method approach to enhance the robustness of the developed scale. Longitudinal designs could provide a more nuanced understanding of the dynamics of adolescent triangulation over time. Furthermore, exploring the scale's applicability in various cultural contexts would enhance its cross-cultural validity. Addressing these limitations would contribute to the refinement and broader utility of the developed scale.

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