



Devising and Validating the Adolescent Attachment Styles Questionnaire (AASQ)

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Abstract

Introduction: One of the most influential and current theories that opened new windows towards the horizon of theorizing and psychotherapy is *attachment theory* that was developed out of works by Bowlby and Ainsworth. Of course it is worth noting that nearly none of the measures in this area specifically devised for the adolescence. So the purpose of this study is to Devise and Validate the Adolescent Attachment Styles Questionnaire (AASQ).

Materials and methods: Present study, was conducted on 380 high school students from Mashhad by employing Exploratory Factor Analysis (EFA) utilizing principal components method.

Results: Finding reveals that three factors were extracted which were similar to categories described by Ainsworth; then, the validity of instrument was indicated through confirmatory factor analysis (CFA). Finally, the AASQ which includes 23 items and high internal consistency coefficients is presented.

Conclusion: AASQ can be applied for adolescence but due to some limitations of the AASQ and also the significant difference between boys and girls in this questionnaire, it is recommended that the questionnaire will be separately normalized for each gender.

1. Introduction

One of the most important and well-known products of contemporary psychology is attachment theory. Some of the researchers (for example, [Shaver and Mikulincer, 2005](#)) consider attachment theory to be a resurrection of psychoanalysis and the important factor in reviving this school. As John Bowlby believes attachment is one of the human's basic needs ([Ghorbani, 2003](#)). As Bowlby ([1973, 1982](#)) states, a bond is shaped with the primary caregiver (mainly mother) and according to the quality of this bond the child forms Internal Working Models of him/herself.

Internal Working Models of others and self is the main reason for continuity and coherence between primary attachment experiences and later cognitions, behaviors, and relationships. These patterns tend to be displayed and applied in new conditions and relationships and can influence the function of attachment system in future social interactions and close relationships. In other words, individuals' attachment styles are based on the internalization of interpersonal expectations regarding the availability and responsiveness of attachment figures and the efficiency and value of oneself ([Kafetsios, 2004](#)).

The early investigations are based on researches by Ainsworth and her colleagues ([1973, cited in Van Ijzendoorn and Kranenburg, 2004](#)). Ainsworth and her colleagues designed an experimental and objective situation called "strange situation" in which the child would experience three stress provoking components: 1- strange situation, 2- interaction with a stranger and, 3- two short-time separations from parents or caregiver. On this basis, three separate attachment styles are identified: 1- secure attachment, 2- avoidant attachment and, 3- ambivalent attachment. Later, Main and Solomon ([1990](#)) investigated some infants who could not be placed in the mentioned groups and stated that these infants are the most insecure group of infants due to being in undesirable and inappropriate family conditions. These infants are categorized in a group called disorganized-disoriented attachment. Waters and Beauchaine ([2003](#)) believe that description of Ainsworth from attachment models in the Strange Situation Test is

one of the most well-known and confirmed (or unfailing) explanatory methods in evolutionary psychology.

Despite this fact, attachment theorists have not paid enough attention to the point that Ainsworth categorizations, called ABC, offers a valid (or appropriate) categorization as well as the mechanisms that may accurately indicate the attachment models. The authors conclude that attachment theory does not attend to (dimensional or class) structure of individual differences. In spite of this, if there are enough studies to cover the behavior of secure base in natural situations the methods of investigating categorizations can play an important role in studying attachment.

The attachment behaviors in adolescence seem to have been rapidly deviated from the attachment behavior patterns in early years of life. Bowlby ([1980](#)) and Bertherton ([1990 cited in Zimmerman and Becker-Stoll, 2002](#)) describe the adolescence in this way: in adolescence active internal patterns may finally become constant and as the result they become resistant to change. During the childhood, as the abilities grow, the attachment behaviors would be less than the infancy. Therefore, there is less possibility to observe proximity seeking behavior and instead we would observe communicating through expression of feelings and concerns towards caregivers when it is needed. Allen and Land ([2008](#)) believe that exploratory system in adolescence, particularly with regards to the attachment to parents and also lowering the dependence on them, have higher importance. They believe that without such exploration, completion of the important task of social evolution in adolescence and early adulthood, such as starting long term romantic relationship and constructive jobs would be difficult – if not impossible.

In adolescence and adulthood attachment system (or organization) is usually evaluated through Adult Attachment Interview (AAI). Main ([1991](#)) introduces AAI as: a semi-structured interview which evaluates the state of mind with regard to the history of individual attachment that is coherence of issues about attachment experiences and emotional integration about these experiences. The four-part categorizations of AAI include: autonomous,

dismissive, preoccupied, and unresolved, which are almost supposed in agreement with categorizations of attachment in infant (secure, avoidant, ambivalent, disorganized-disoriented) (Rosenstein and Horowitz, 1996). Furthermore, as Zimmerman and his colleagues (1997) state, the experimental evidence show that representations of 10 year-old infants from emotional availability of parents and their supports predicts categorizations of AAI when the infant is 16 years old (Zimmerman and Becker-Stoll, 2002).

After the AAI was devised, Pottharst and Kessler (described in Pottharst, 1990) offered Attachment History Questionnaire (AHQ) to evaluate adults' memories from experiences related to attachment in childhood (such as separation from parents and the quality of attachment relationships). Armsden and Greenberg (1978) also devised Inventory of Parent and Peer Attachment (IPPA) to evaluate perceived quality of adolescent's current relationships with their parents and peers. On the other side, West and Sheldon-Keller (1994; West et al., 1987) prepared two self-report instruments called Reciprocal Attachment Questionnaire for Adults and Avoidant Attachment Questionnaire for Adults in order to evaluate individual differences in early attachment in adulthood. Around the same time, Hazan and Shaver also investigated uses of attachment theory in general and Ainsworth's categorizations for infancy in particular, with the aim of studying feelings and behaviors of adolescents and adults in affective relationships.

Different researchers aimed at introducing interviews for evaluating attachment representations for adults' affective relationships, including Bartholomew and Horowitz (1991), Cowan et al. (1999), Crowell and Owens (1996), Dickstein et al. (2004), and Furman and Simon (2006). Most of the interviews are rooted in AAI tradition regarding the coherence of individual's talks about attachment memories and findings resulted from these interviews, AAI, and self-report instruments related to the observed relationships and behaviors of couples towards each other have shown some similarities. Among these interviews the Current Relationship Interview (CRI) has specific importance (Crowell and Owens, 1996; Crowell et al., 2002; Crowell et al.,

2002). This instrument evaluates attachment representations in a marital relationship related to adults. This interview is devised for the famous hypothesis test called "Prototype Hypothesis" which states that the organization of adults close relationships is similar to parent-child attachment relationships (Crowell et al., 2008).

From the late 80s and along with general tendency to investigate attachment in adults, some of the researchers attempted to offer some instruments in this field. Among the most important, we can name Hazan and Shaver (1987; 1990), Bernan and Shaver (1995), Carver (1997) Feeny et al (1994), Griffin and Bartholomew (1994), Bartholomew (1990), Bartholomew and Horowitz (1991) (In Crowell et al., 2008). One other instrument is Adult Attachment Projective (AAP) that is a projective story technique for measuring adults' attachment (Buchheim et al., 2003; George and West, 2001).

1.1. Purpose

Up to the present time, the same questionnaire for adults have been used in order to evaluate attachment in adolescents, such as questionnaires by Hazan and Shaver (1987; 1990), and Bartholomew and Horowitz (1991), Adult Attachment Interview (AAI) and other instruments mentioned above. But, to the best knowledge of researchers, there are two instruments that specifically measures attachment in adolescence, the new and revised version of Inventory of Parent and Peer Attachment (IPPA) and Parental Attachment Questionnaire (PAQ). It is worth mentioning that attachment categorizations are not applied in Inventory of Parent and Peer Attachment-Revised (IPPA-R) and the relationship components between adolescents and their parents are measured. On this basis and as it was stated before, each subject gets one score for each of the attachment variables to mother, father, and peer, and finally the general attachment score would be calculated. In each of the three sub-scales, three other sub-scales called trust, relationship, and alienation are measured. Parental Attachment Questionnaire (Kenny, 1990) is a self-report instrument for measuring adolescent attachment to his/her parents (individually or generally) and

includes 41 items which provides scores in two scales: 1- affective quality of relationship with the parents (PAQa) and 2- parents as facilitators of autonomy (PAQb). The first scale measures the components of bond and connection, while the second measures the components of psychological autonomy of attachment. The scores are devised on a Likert scale from 1 (not at all) to 5 (very much). The scales showed high internal consistency with the Cronbach's alpha equal to 88.96% and 88% respectively (Kenny, 1990).

Also, there has been no significant attempt for measuring attachment in adolescents in Iran. This may be due to the fact that – just like the other countries – attachment in adolescents is considered to be the same as adults. Regarding the adulthood attachment we can refer to Adult Attachment Inventory by Besharat (see Besharat et al., 2001) that is devised and normalized based on samples from Mashhad University students. The study, with reference to need for measuring attachment models in adolescents, aims at devising a questionnaire and to test its validity and reliability.

2. Method

2.1. Participants

The participants of this study were 380 students from two educational districts of Mashhad, which includes 166 boys (Standard Deviation (SD) =.93 and mean (M) =15.9) and 214 girls (SD=.91 and M=16.2).

2.2. Procedure

In this study, 42 questions are devised with regard to the attachment literature and with reference to instruments such as Adult Attachment Interview (AAI), adult attachment questionnaires by Hazen and Shaver (1990) and Bartholomew and Horowitz (1991), The Inventory of Parent and Peer Attachment-Revised (IPPA-R) (Armsden and Greenberg, 1987) and also the studies of researchers in this field. The questions that are based on three attachment styles of secure, avoidant, and ambivalent are sent to two experienced professors in this field as well as two PHD students of psychology for review. After receiving the feedbacks and comments from the

reviewers the questionnaire is reduced to 40 questions.

3. Results

The factor structure of this scale was examined in two stages through exploratory factor analysis as well as confirmatory factor analysis.

3.1. Exploratory factor analysis (EFA)

After complete data correction, the data were analyzed by SPSS. In order to reduce the questions to significant factors, at first factor analysis was done on 40 questions by the main elements. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy showed that the sample is suitable for factor analysis (KMO=.83), also Bartlett's Test of Sphericity with the degree of freedom (df) equal to 378 and chi-square (χ^2) equal to 3295.50 was significant at the level of $p < .01$. All of the Anti-image Matrices (except for items 15 and 17) were above .71. Based on all of the mentioned indices the (EFA) of the questions resulted in 8 factors with Eigen value more than 1. Generally, these 8 factors explain 60.4% of the total variance. Considering the Eigen values showed four items with Eigen value above 2. For the aim of final selection of factors besides the criterion of Eigen value, the Kattel's Scree plot was also considered.

Considering the plot showed that the peak for the plot can be determined from the fourth factor. On the other side, these four factors totally explain 43.83% of the variance.

Table 1 shows, the first factor with Eigen value 9 has the highest percentage of variance explained (22.51%). The rotated factors with the Rotation Method of Varimax with Kaiser Normalization with the Eigen value above 2 and elimination of factor loadings less than .35 are presented in table 2. As it is evident from table 2, items 40 and 38 in have factor loading near to and more than .4 for the A and B factors, which means that they should be eliminated from the questionnaire. The thirteen items with a factor, except for items 14 and 23, are the items measuring avoidant scale. The thirteen items with B factors include eight items related to secure, four items related to ambivalent and one item related to avoidant scale. All of the items with

the C factors measure ambivalent scale, except for item 12 which measure secure scale. As it is shown in the table, item 21 has factor loading above .4 in factors A and C, therefore this item is eliminated.

3.2. Confirmatory factor analysis (CFA)

For the aim of confirmatory factor analysis, first through examining the Cronbach's alpha coefficients for each item and their correlation coefficients and the total score of each scale, it was shown that elimination of none of the items would not lead to increase in α coefficient. For item 23, since the content was related to factor C (ambivalent), it was eliminated from factor A and was added to factor C. Examining the reliability of factor B showed that this scale has acceptable reliability (.85) and it would not change by eliminating or reversing any of the items.

Examining factor C indicated acceptable reliability of .64, which changed to .67 by adding item 23. As the result, nine items from factor A, ten items from factor B and eleven items from factor C would enter analysis that their elimination would not lead to higher reliability. At last, thirty items entered confirmatory factor analysis.

Confirmatory factor analysis model was used with the aim of proving factor structure of "Adolescent Attachment Questionnaire", which was done using Lisrel 8.5 and SIMPLIS software. Maximum likelihood was used for estimation of pattern and the following indices were used for fitness of pattern: chi-square (χ^2), root mean square error of approximation (RMSEA), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), normed fit index (NFI), non-normed fit index (NNFI), incremental fit index (IFI), and comparative fit index (CFI). These indices were used as criteria for adjusting the model with the observed data.

The most important statistic for fitness is chi-square; this statistic measures the difference between observed and the estimated matrix. Hooman (2005) believes that this index measures this null hypothesis: "there is no significant difference in diagonal matrices the structure of covariance". This is called non-fitness index, because the significance result of this index may lead to the rejection of fitness of a specific model.

This statistic is very sensitive to the number of samples and therefore in huge samples it is divided by DF and it is acceptable if it is less than 2. But, as Hooman (2005) also states, this index lacks a stable criteria for an acceptable model. This index is usually significant for samples more than 100 therefore it is not considered a reliable index for fitness of model. As it is presented in table 5, this index is more than 2 and is significant at the level of $p < .01$.

Other indices including CFI, GFI, and AGFI that are more than .90 and RMSEA which is less than .05 indicate acceptable and suitable fitness. The RMSEA index for the models with good fitness is less than .05, therefore it could be said that .087 that resulted for the present study shows fairly good fitness. Indices of CFI, GFI, AGFI, and NFI are shown on a range of 0 to 1; the more it is near to 1, it shows more suitable fitness. As it is clear from table 3, all of these indices are acceptable for the questionnaire. In general, with regard to the mentioned indices, the model can be confirmed. Table 3 reports the main measurement parameters and all of the factor loadings reported at the level of $p < .01$ are significant.

Table 4 shows parameters including standard factor loading, non-standard factor loading, standard deviations, T values, and Squared Multiple Correlations which show the accuracy or inaccuracy of the items for each subscale. T value in this table shows that all of the factor loadings are significant at the level of $p < .01$. According to table 4 and in agreement with the model presented in table 3 and confirms the fitness of model, measuring parameters of the structures are appropriate and accurate.

The standardized parameter shows the effects of factor loading of each item for various sub-scales. It also indicates that how much of variance for sub-scale is explained by each item. If the factor loading is larger, it explains a better variance and in general these factor loadings show the total variance of each sub-scale. When the amount of T is above 2, it indicates the significance. As it is evident all of the reported cases are significant at the level of $p < .01$. These coefficients are actually the criteria of linear correlation and Squared Multiple Correlations and they also show the explained variance. Table 5

presents the items in the questionnaire that are classified based on the sub-scales.

Table1. Statistical indices including Eigen value and the percent of variance explained

Factor	Eigen Value	percentage of variance explained	Cumulative percentage of variance explained
1	9	22.51	22.51
2	3.68	9.21	31.72
3	2.63	6.58	38.31
4	2.21	5.54	43.85

Table2. Rotated Component Matrix

Item	Raw Factor			Revised Factor		
	A	B	C	A	B	C
32	0.918			0.743		
34	0.987			0.709		
33	0.849			0.666		
31	0.841			0.656		
36	0.809			0.620		
35	0.633			0.583		
37	0.708			0.579		
40	0.799	0.645		0.566	0.457	
38	0.656	0.567		0.522	0.476	
14	0.681			0.491		
30	0.541			0.489		
29	0.399			0.483		
23	0.559			0.440		
20						
5						
28						
15						
11		0.670			0.699	
9		0.514			0.679	
8		0.593			0.622	
26		0.609			0.621	
19		0.643			0.620	
10		0.456			0.601	
2		0.585			0.595	
7		0.444			0.498	
1		0.459			0.497	
27		0.460			0.470	
39		0.368			0.457	
18		0.582			0.457	
3		0.447			0.453	
4						
6						

Table2. Rotated Component Matrix(**continue**)

22					
17			0.785		0.579
16			0.865		0.574
13			0.745		0.570
24			0.655		0.517
21	0.532		0.641	0.417	0.504
25			0.615		0.471
12			0.459		0.402

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Table3. Indices for fitness of Adolescent Attachment Questionnaire (AAQ)

Scales	χ^2	df	χ^2/df	RMSEA	GFI	AGFA	NFI	NNFI	IFI	CFI
	2980.8	347	8.5	0.087	0.75	0.71	0.88	0.88	0.89	0.89

Table4. Standardized factor loading, non-standardized factor loading, standard deviation, T value, Squared Multiple Correlations of the items for Adolescent Attachment Questionnaire

Scale	Item	non-standardized factor loading	standardized factor loading	St. d	T	Squared Multiple Correlations
Secure attachment	1	1.60	0.84	0.06	26	0.70
	2	1.73	0.87	0.06	27.70	0.76
	3	1.05	0.82	0.04	25.03	0.67
	4	0.99	0.70	0.05	19.93	0.48
	5	1.14	0.79	0.05	23.97	0.63
	6	1.20	0.83	0.05	25.85	0.70
	7	1.80	0.87	0.07	27.56	0.75
Ambivalent attachment	10	2.00	0.88	0.07	28.11	0.77
	11	0.28	0.18	0.06	4.05	0.03
	15	1.44	0.85	0.06	25.86	0.71
	19	0.50	0.33	0.06	8.27	0.11
	20	0.32	0.23	0.06	5.69	0.05
	21	1.53	0.94	0.05	30.65	0.88
	22	1.67	0.80	0.07	23.99	0.65
Avoidant attachment	23	1.16	0.71	0.06	20.15	0.51
	24	0.74	0.51	0.06	12.56	0.26
	25	0.90	0.64	0.05	16.51	0.41
	27	0.76	0.61	0.05	15.50	0.37
	28	0.60	0.42	0.06	10.13	0.18
	29	0.66	0.46	0.06	11.30	0.22
	30	0.83	0.61	0.05	15.47	0.37
31	0.78	0.49	0.06	12.08	0.24	
32	0.84	0.65	0.06	14.00	0.31	

Table5. Correlation matrix for attachment styles in AAQ

	secure	ambivalent	avoidant	total
secure	1			
ambivalent	-0.60	1		
avoidant	-0.54	0.56**	1	
total	0.86**	-0.45**	-0.54**	1

3.3. Reliability

In order to ensure the reliability of the questionnaire, a pilot study was conducted on 56 high school boy students with the mean age of 15.3 and standard deviation of .95; three participants were excluded due to incomplete answers. After three weeks the questionnaire was administered again and each of the abovementioned sub-scales was determined. The correlation coefficients between the two administrations were: .74 for secure sub-scale, .70 for ambivalent, and .84 for avoidant; all of the sub-scales showed significance level of .01. The internal consistency test through Cronbach's alpha (n=380) showed acceptable internal consistency for the questionnaire ($\alpha=.88$). The internal consistency for each of the sub-scales was: .81 for secure, .77 for ambivalent, and .87 for avoidant, which indicated fairly good reliability for the questionnaire.

4. Discussion

In order to evaluate attachment in adolescence there are few instruments available among which we can name The Inventory of Parent and Peer Attachment-Revised (IPPA-R) and Parental Attachment Questionnaire (PAQ). As it was explained, the categorization for attachment was not used IPPA-R and the quality of attachment and relational elements between adolescents and their parents (such as trust, relationship and alienation) are evaluated. Parental Attachment Questionnaire (Kenny, 1990) is another instrument that is used for measuring adolescent's attachment to his/her parents (individually or both of them together) and it includes 41 items with two scales: 1- the affective quality of relationship with parents (PAQa), and 2- parents as facilitators of autonomy (PAQb). The first scale measures the elements of connection and bond while the second scale measures the psychological self-determining element of attachment. The scales in this questionnaire showed high internal consistency through (.96, .88, and .88 respectively) Cronbach's alpha (Kenny, 1990).

In the present study, in order to estimate the correlation coefficient of test-retest reliability the questionnaire was administered to a sample of 56 individuals. The correlation coefficient for test-

retest reliability was as follows: .74 for secure, .70 for ambivalent, and .84 for avoidant scales, which all of them were significant at the level of .01. Also, investigating the internal consistency of the questionnaire through Cronbach's alpha (n=380) indicated that the questionnaire has good internal consistency ($\alpha=.88$). This amount was .81 for secure, .77 for ambivalent, and .87 for avoidant scales, which confirms good reliability for the questionnaire.

In exploratory factor analysis, the Scree plot suggested 4-factor model. As we saw in table 1, four components that resulted from the method of factor analysis of main factors totally explained 43.85 percent of the questionnaire's variance. Through the rotation with the method of Varimax with Kaiser Normalization, the four components were reduced to three components which were completely similar to three styles of attachment described by Ainsworth (1989) and other attachment researchers. Also, as it was shown in table 5, the matrix of correlations of theoretical components and the total score of the questionnaire was significantly correlated in the level of .01 for all of the subscales. Furthermore, as suspected the relationship between secure attachment and ambivalent and avoidant attachment is negative as well as the relationship between ambivalent/avoidant styles with total attachment score. This confirms the internal validity for the devised questionnaire.

In confirmatory factor analysis also the highest estimate was for the same three-factor model. Therefore, from the view of factor structure, existence of three factors in the present study is conformed. In confirmatory factor analysis, which aimed at investigating the construct validity of different subscales of AAQ, as it was shown in table 5, the data are coordinated with the determined factor structure. This indicates good and reliable construct validity; therefore the fitness of the model is confirmed. In other words, it can be said that the data of the present study are coordinated with the model and all of the estimated indices indicate that the model has good fitness with the data.

Table 2, which presents exploratory factor analysis for evaluation of coordination of the items, shows that item 21 related to ambivalent attachment factor and items 38 and 40 related to avoidant attachment factor have factor loadings close to each other for two factors. Therefore, it is better to eliminate these three items from the questionnaire (Sarmad et al., 2004). Also, after various rotations, seven items showed no factor loading enough on none of the factors. The remaining items of the questionnaire for different sub-scales, showed significant amount of factor loading and each item can explain a part of total variance in each sub-scale.

Considering the amount of t and squared multiple correlations in table 4 shows that this amount for items 12 and 14 is lower than 1.96 which means that these two items must be eliminated from the questionnaire. Items 19 and 20, despite low squared multiple correlations are not eliminated due to the significant of their t and their contents which is closely related to ambivalent attachment style.

At last, the final questionnaire resulted including 23 items from the primary 40 items and three factors as follows: Factor A with standardized factor loading (B) range between .42 and .68 includes 9 items which is called "avoidant attachment style". Some of the items for the first factor are: I hate friendship/ I think people engage in friendship for their own benefit/ I think no one is trustworthy. Factor B with standardized factor loading (B) range between .70 and .94 includes 10 items which was called "secure attachment style" due to the nature and content of the items. Some of the items are: I feel that I am a valuable individual/ I like myself/ I think that people who know me like me Factor C with standardized factor loading (B) range between .10 and .94 includes 9 items which was named as "ambivalent attachment style". Some of the items are: All the time, I am worried that my friends do not love me/ I am usually worried about losing my dearest ones / Many times I experience doubt in decision making

MANOVA is used in order to compare the means for boys and girls in each of the factor and to eliminate the correlation effects between the factors. The results indicated that there was

significant difference between boys and girls. Also, MANOVA test for different age groups from 14 to 17 showed no significant difference in the means of the factors in none of the age groups. The results of one-way variance analysis for the comparison of different birth ranks also showed no significant difference in none of the factors and total attachment scores.

The results of internal consistency through Cronbach's alpha for the secure, ambivalent, and avoidant sub-scales as well as the total attachment score in the final (28-item) questionnaire are as follows respectively: .82, .67, .87, and .83 for all of the subjects, .84, .70, .87, and .83 for boys, and .76, .53, .87, and .82 for girls; these results confirm high internal consistency for the questionnaire.

Considering the literature on attachment, the Adolescent Attachment Questionnaire is one of the few instruments which specifically measure the attachment styles in adolescence. This questionnaire can be applied in two ways: This questionnaire is applicable for adolescence ages. Some of limitations of this questionnaire are: A) regarding the fact that the population under study were from adolescents of 14-17 ages from two districts from Mashhad, the results may not be generalizable and it may require further research with other populations and age groups. B) Another limitation, usually reported for the self-report instruments, is prejudice and social acceptance. As the results revealed significant difference between boys and girls, it is recommended that the questionnaire is separately normalized for each gender.

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