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Development of Preschool Children Sibling Rivalry Scale (PSRS)

Aysun Ata Aktürk[1,2] · Hasibe Özlen Demircan[1]

Abstract The purpose of the current study was to develop a valid and reliable scale to assess the sibling rivalry behavior of 3–6-year-old preschool children with one or more younger siblings, based on their parents' reports. The pilot study was conducted with 544 parents. Through exploratory factor analysis, six factors were obtained: warmth/closeness, parental partiality, competition, regression and restlessness, antagonism, and negative behavioral changes. The validation study was conducted with 203 parents, using the final version of the scale consisting of 39 items. Confirmatory factor analysis results verified the six-factor solution. The Cronbach's alpha values for the six factors ranged from .63 to .82. The findings showed the reliability and validity of the Preschool Children Sibling Rivalry Scale.

Keywords Preschool children · Siblings · Sibling jealousy · Sibling rivalry

1 Introduction

Early childhood years are a time when the child is provided with all sorts of stimuli such as social, emotional, cognitive, linguistic, psychological, and physical (Darragh 2010). According to Yavuzer (2013), the first six years of life are notable for children in terms of not only making progress in all developmental fields, but also laying the foundation for future personal traits such as habits, beliefs, and characteristics. In these early years, bereavement, parents' divorce, exposure to violence, or the birth of a new

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✉ Aysun Ata Aktürk
aysun.ata@metu.edu.tr

[1] Early Childhood Education, Middle East Technical University, Ankara, Turkey

[2] Faculty of Education, Department of Elementary Education, Middle East Technical University Campus, Ankara, Turkey

sibling can easily affect young children. Sibling rivalry resulting from the arrival of a new "favorite" in the home is one of these events that can cause long-reaching effects on children (Gottesman 2013). Managing the rivalry between their children is one of the main concerns of families. Thus, sibling rivalry is a vital subject that attracts the attention of families and the popular press (Kolak and Volling 2011).

Volling et al. (2010, p. 387) described sibling rivalry as "the feelings of envy, jealousy, and competitiveness that exist between brothers and sisters within the family." On the other hand, Neubauer (1983) drew attention to the distinction between the notions of rivalry and jealousy. He stated that while rivalry is the fear of losing the source like parents, jealousy is the fear of losing the love and attention of the source because of a rival. Howe and Recchia (2008) claimed that sibling rivalry is a manifestation of sibling jealousy.

In the literature, three different theories have dealt with sibling rivalry. The first is the family structure theory. Family structure theorists, including Alfred Adler, focus on the birth order, gender, and age gap between siblings. According to Adler (1927/2014), sibling rivalry tends to exist especially between opposite-sex siblings. Consistent with Adler's claim, some researchers have argued that parents treat opposite-sex siblings unequally. Hence, the difference in the treatment of parents can further stimulate sibling rivalry (Kolak and Volling 2011).

Studies have also indicated that negative behavioral changes can occur in preschool children after the birth of a same-sex sibling (Howe and Recchia 2008). According to Reit (1985), the similar needs and interests of same-sex siblings may cause sibling rivalry. Family structure theory posits that in addition to gender, the birth order of siblings also influences their rivalry. The firstborn child envies the second one, who is the first child to "dethrone" the firstborn. Since second-born children in a family have never been the exclusive focus of interest, they are not impressed by the birth of a new sibling; rather, they tend to compare themselves with their older sibling. Even if the youngest child is never dethroned, the child still tries to prove himself/herself due to a feeling of weakness (Webster 1998). However, the most intense rivalry is between the first- and second-born opposite-sex siblings who are close in age (Jones 1987). Smaller age gaps between siblings increase the intensity of rivalry (Adler 1931; Furman and Buhrmester 1985). Like their younger siblings, older children experience jealousy, but they are more successful in regulating their emotions (Volling et al. 2002).

The second theory examining sibling rivalry is the sibling differentiation theory. This theory focuses on the similar and different characteristics of siblings. According to this theory, every child in a family is unique, and the children should not be regarded as similar to each other. Every child undertakes different roles, which are assigned to them by family members. When one is compared with a sibling, such as when a sociable child is compared with a silent sibling, the competition and rivalry between siblings can be encouraged (Jones 1987).

The last theory that focuses on sibling rivalry is the differential parental treatment theory, which focuses on the role of parents in causing sibling rivalry. According to this theory, the family plays a prominent role in introducing the concepts of fairness and equity to the children's lives. Therefore, the reflection of these notions on family experiences might influence the child-parent relationship. Moreover, witnessing their parents' consistent or inconsistent behaviors in applying rules without any discrimination between siblings and events has an effect on children's rivalry behavior (Ihinger 1975).

1.1 Sibling Rivalry from the Viewpoint of Psychoanalytic Theory and Attachment Theory

In addition to the three aforementioned frameworks, sibling rivalry has been examined by the psychoanalytic school of thought. Freud (1946) considered having a new sibling as a traumatic experience for a preschool child. He drew attention to some changes in the older child that are seen after the birth of the sibling by examining the behavioral changes and responses of his young patient "Hans" using the psychoanalytic framework (Freud, 1909/2013). His study revealed that little Hans envied his newborn sister and consoled himself with the absence of her teeth. Since the new baby did not yet have teeth and could not talk, Hans looked down on her. Hans had difficulty in accepting the presence of his new sibling and asked his parents to bring her back to where she came from. Even though his jealous behavior seemed to transform into protectiveness and compassion over time, Freud (1909/2013) believed that this compassion could be a form of suppression of jealousy. This is because while Hans indicated affection toward his sister Hanna, he also stated that storks should no longer bring babies.

Wakefield (2007) explained the situation of Hans using the concept of oedipal fantasy, which means a symbolic form of sexual passion for the mother and appears in girls for the father as the Electra complex. Oedipal and Electra complexes trigger sibling rivalry because the child expects interest from the parent whom they admire. However, the child sees that parental interest and love will now be shared with a newborn sibling (Larmo 2007). When examined from a psychoanalytic perspective, Hans' history can be summarized as follows: Since Hans thinks that his sister is stealing his mother's attention and time from him, Hans is angry with Hanna. Even if Hanna is not his sexual rival like his father is, he does not want to share his mother with this new baby (Garrison 1978).

An alternative explanation of sibling rivalry and Hans' situation was presented by John Bowlby, the founder of attachment theory. According to the theory, attachment is defined as a tie established with a selected person to reach a sense of proximity and security. Attachment experiences in childhood may affect the psychological development and adulthood relationships of children (Schaffer 2004). The person, usually the mother, serves as a guide for the child to recognize and understand the world safely; thus, in settings without the mother, the child experiences worry and stress (separation anxiety). According to Ainsworth (1979), securely attached babies are aware that even if the mother is not within sight, she is ready when the baby needs her, whereas anxiously attached babies respond with more anxiety in separation cases and behave in an undecided manner when reunited with their mother. The child wants to be close to the mother, but at the same time, the child resists this proximity. In addition to these two attachment styles, avoidant attached babies neither respond stressfully to separation nor become happy and seek contact with the mother upon reunion. Bowlby (1973) emphasized that Hans wanted to return to his mother. Indeed, he cried when he went to the park with his caretaker and asked questions about his mother's absence. Bowlby interpreted Hans' situation in terms of mother-child attachment and stated that the source of Hans' situation is anxious (insecure) attachment. When examined from the framework of attachment theory, Hans desires his mother's attention and proximity, but in addition to his father, who is a sexual rival, a new rival arrives in Hans' life with the birth of the new baby. This

new rival can withhold Hans' mother from showing interest in and love for him (Wakefield 2007).

1.2 Sibling Rivalry and Concomitant Changes

Sibling rivalry has a negative connotation at first glance. However, Reit (1985) stated that sibling rivalry is a fact of life and that every sibling around the world experiences it. Every sibling serves as a tutor for their sibling via common shared experiences. Siblings gain empathy skills via conflicts, which are one of these shared experiences (Brabender 2006). Sibling rivalry is a secure way of learning to solve disagreements constructively and handle positive and negative feelings (Howe and Recchia 2006).

On the other hand, it is possible to mention about some negative effects of sibling rivalry on children (Baydar et al. 1997; Larmo 2007). In their longitudinal research, Kolak and Volling (2011) examined the predictive power of sibling jealousy on later relationships between siblings. They observed 35 families with two children (4 years old and 16 months old) during their free play at Time 1 and 2.5 years later at Time 2. Findings indicated that sibling rivalry was positively associated with the children's later poor and troubled sibling relationships.

The older child may experience complicated feelings with the birth of a new sibling (Coles 2015; Howe and Recchia 2008). On the one hand, the child may worry about being ignored or being obliged to share the parents' love and attention with the sibling (Sparrow 2006). On the other hand, helping the mother with the care of a new baby may make the firstborn child happy at the beginning. But after a few weeks, the child may show some negative responses (Nadelman and Begun 1982) due to the feeling of dethronement and the fear of loss of exclusive parental love and attention (Adler, 1927/2014). As a result of jealousy, the child may experience the feelings of insecurity and loneliness, and these feelings may reflect on her/his behaviors as introversion and distancing themselves from their parents (Yavuzer 2013). Similarly, as a result of the child's ambivalence, the child can exhibit both positive behaviors such as attraction and closeness to the baby and negative behaviors such as being clingy, aggressive, or stressful (Howe and Recchia 2008). Since the child cannot deal with these complicated feelings, parents and educators should take the necessary precautions rather than deny these feelings.

To reduce the negative effects of sibling rivalry, sibling rivalry and its related factors must be examined and understood better and accepted as a normal and healthy part of family life (Larmo 2007). Families should manage sibling rivalry and conflict effectively rather than prevent them. Fights, debates, and competition between siblings are unavoidable, but if managed appropriately, they can provide siblings with the opportunity for acceptance and allow them to make bargains with their siblings (Reit 1985; Sparrow 2006).

1.3 Existing Instruments for Measuring Sibling Rivalry

Sibling rivalry is a significant topic in the social-emotional and characteristic development of children. Its positive and negative effects on children might continue throughout their lives (Baydar et al. 1997; Gottesman 2013; Milevsky 2011; Sparrow 2006). Although the possible causes of sibling rivalry have been examined in the literature

(Baydar et al. 1997; Gottesman 2013; Jones 1987; Kolak and Volling 2011; Loeser 2011; Sparrow 2006), a limited number of scales have been developed to measure the sibling rivalry of children (Boer et al. 1997; Hoyer 1982; Jones 1987; Webster 1998), as summarized in Table 2.

Some scales measuring sibling interaction or sibling relationships include items related to rivalry between siblings. For example, Boer et al. (1997) developed the Sibling Relationship Inventory (SRI) to measure 5–12-year-old siblings' comprehension of their relationships with their siblings. In this scale, sibling rivalry is regarded as a sub-scale. But the sibling rivalry sub-scale in the SRI only includes items related to parental differential treatment. Similarly, in the Sibling Relationship Scale (SRS) developed by Furman and Buhrmester (1985) and modified by Jones (1987), sibling rivalry is represented by sub-scales such as jealousy and desire for equality. The Sibling Envy and Jealousy Scale developed by Webster (1998) directly measures sibling rivalry but does not cater to preschool children. However, as the age interval between siblings declines, sibling rivalry and conflict becomes more distinguishable (Aguilar et al. 2001; Jones 1987). Since preschool children are closer in age to their siblings, it is important to measure their rivalry.

Yiğen (2005) prepared a survey for measuring the sibling rivalry of 3–6-year-old children who have siblings and administered this survey to the mothers. However, any validity and reliability analysis for the survey was not performed. To correctly evaluate the sibling rivalry of 3–6-year-old preschool children, the construct must be accurately measured. Therefore, the present study aims to address the lack of an accurate measure of preschool children's sibling rivalry by developing a valid and reliable scale assessing preschool children's sibling rivalry based on their parents' reports.

2 Method

2.1 Participants of the Study

Since parents' responses are important and serve as a guide for research related to young children (Zupančič and Kavčič 2011), the present study used parents' reports. The data were collected from two independent samples for the pilot and validation studies. The pilot study was conducted for two months in the spring semester of the 2014–2015 academic year, while the validation study was conducted for one and a half month in the fall semester of the 2015–2016 academic year.

Since reaching all parents of preschool children with one or more siblings in Turkey was not feasible, convenience sampling was used to select the participants. In convenience sampling, available individuals are chosen to obtain the required information (Fraenkel et al. 2012). In the present study, parents of preschool children who have one or more sibling were reached by the researchers through preschool teachers who were in touch with. That is, preschool teachers took the charge of a mediate role between parents and researchers during data collection process. After questionnaires were conveyed parents of only 3-6-year-old children who had one or more younger sibling, they were collected in one week and posted by these teachers who work in different cities of Turkey to the researchers. In this way, for the pilot study, 544 parents (411 mothers, 126 fathers and 7 no respondents) of 3-6 years-old preschool children who

had one or more younger siblings were selected from 32 different cities of the Turkey. On the other hand, 203 parents (156 mothers, 43 fathers and 4 no respondents) of 3-6 years-old preschool children who had one or more younger siblings were selected from 14 different cities of Turkey for the validation study (see Table 1).

2.2 Research Instrument

The data collection instrument was divided into two parts. The first part was a demographic information form including questions related to gender, birth order and ages of siblings, size of the family, and parents' educational level. The second part was the Preschool Children Sibling Rivalry Scale (PSRS) developed by the researchers to measure preschool children's sibling rivalry based on their parents' reports.

2.2.1 PSRS Development Process

In the first step of the scale development process, an initial pool of 58 items was formed by the researchers based on a detailed literature review. Databases that enable broad searches were examined to understand the theoretical basis of sibling rivalry. Besides of the theories which handle the subject of sibling rivalry, instruments developed for measuring sibling relationships and sibling rivalry of children form basis for PSRS. The instruments used as references in this study and their comparison with the PSRS are summarized in Table 2. Some of the items in the PSRS were created by the researchers of this study, who are also early childhood educators. The researchers drew on their experiences with their students and other preschool children around them who have siblings younger than them.

After a draft form including items and sub-dimensions of the PSRS was constructed, in the second step, some methods were used to ensure the content and construct validity of the scale. While construct validity was ensured through factor analyses, five experts' opinions were obtained to ensure content validity. After considering the suggestions of three experts (who are assistant professors in early childhood education) concerning the items that seemed repetitive and irrelevant to the construct, the scale was reviewed again. In addition, since the scales used as reference at the item creation stage of this study generally had been prepared for measuring sibling rivalry and relationships of older children and even adults, experts also examined each item in terms of their appropriateness for 3-6-year-old preschool children. Afterwards, the items of the scale were examined and checked the clarity of language and suitability of the items to the

Table 1 Characteristics of the sample

Gender of the parents	Pilot study		Main study	
	F	%	F	%
Male	126	23.16	156	76.84
Female	411	75.55	43	21.18
Missing	7	1.28	4	1.9
Total	544	100	203	100

Table 2 Related instruments used as references in the development of the PSRS

Instrument	Sub-dimensions	Comparison with PSRS
Webster and Berry Sibling Envy and Jealousy Scale (SEJS; Webster 1998)	Jealousy Envy	When the items under the parental partiality and competition sub-dimensions of PSRS were created, some items of the Webster and Berry's scale were guide. However, the SEJS was prepared for adults and applied on undergraduate students rather than preschoolers. Therefore, the items created based on this scale in the PSRS were revised and rewritten for preschool children.
Sibling Relationship Questionnaire (SRQ; Jones 1987)	Warmth/Closeness Conflict Rivalry Relative Power/Status	The SRQ developed by Furman and Buhrmester (1985) and revised by Jones (1987) consists of parent and child versions. The child version of the scale is composed of 69 items under four sub-dimensions. As in the SRQ, warmth/closeness is a sub-dimension in the PSRS. However, as an indicator of positive relationships between siblings instead of their conflict and rivalry, items under the warmth/ closeness sub-dimension of the PSRS were coded reversely.
Sibling Relationship Inventory (SRI; Boer et al. 1997)	Affection Hostility Rivalry	The SRI is based on self-reports of 5–12-year-old children. The SRI deals with rivalry between siblings as a sub-dimension to measure their relationship. The rivalry sub-dimension is composed mostly of items concerning parental partiality. The SRI was used as a reference when the items related to the parental partiality sub-dimension of the PSRS were created. However, in the PSRS rated by parents of preschool children sibling rivalry is treated as related to some behavioral changes, antagonism, and competition in addition to parental partiality.
Sibling Interaction Scale (SIS; Hoyer 1982)	Regressive Participative Aggressive	The SIS, which consists of 16 items, is rated by mothers of siblings by considering the behavioral changes observed in their older child after the birth of the new sibling. Similarly, the PSRS is based on parents' reports of their older child's sibling rivalry. Both scales include items related to regressive and aggressive behaviors of older children, which may stem from sibling rivalry. In the PSRS, based on the related literature, items concerning aggressive behaviors are included in the sub-constructs of antagonism and negative behavioral changes. Regressive behaviors are included in the items under the regression and restlessness sub-dimension.
Survey for Identifying Sibling Rivalry of Preschool Children (Yiğen 2005)	The survey was prepared in a unidimensional form by the researcher.	The survey prepared by Yiğen (2005) includes 30 items for measuring the sibling rivalry of preschool children. Mothers respond to questions with "Yes" or "No." This survey was used as one of the main references in the

Table 2 (continued)

Instrument	Sub-dimensions	Comparison with PSRS
		item development process of the PSRS, particularly for the sub-dimension of negative behavioral changes. Factor analyses were not conducted on the survey prepared by Yiğen (2005).

constructs by two experts. Based on the feedback of the five experts, eight items were removed from the scale. Therefore, the final scale for the pilot study consisted of 50 items (10 of which were reverse items) under seven sub-dimensions: negative behavioral changes, warmth/closeness, antagonism, competition, parental partiality, regression, and restlessness.

The PSRS is a 5-point Likert-type scale (1 = *almost never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, and 5 = *always*). Higher scores on the PSRS indicate a higher level of sibling rivalry, and lower scores indicate a lower level of sibling rivalry for preschool children. The items are presented in Appendix A.

2.2.2 Sub-Dimensions of PSRS

Antagonism The antagonism sub-dimension was created based on the psychoanalytic theory. According to the psychoanalytic theory, deep antagonism underlies the love for one's sibling. Individuals secretly desire the death of their sibling, but they regret it when something bad actually happens to the sibling (Webster 1998). As stressed in the literature, the feeling of antagonism may manifest itself as a physical assault against the sibling, such as hurting the sibling when caring for him/her, biting the sibling, and pushing the sibling. In addition to these physical assaults, preschool children might cope with their sibling rivalry using verbal insults (Ostrov et al. 2006; Yiğen 2005) and anger (Volling et al. 2002). In this regard, in the current study, antagonism was identified as a sub-dimension of the PSRS. It includes items associated with the older child's hostile acts toward the sibling, such as pushing when raging at the sibling, calling the sibling names to annoy him/her, complaining about the sibling to the parents, pushing the sibling away when performing a task, and treating the sibling with extreme behaviors (e.g., pinching, pulling his/her hair, biting, dropping him/her accidentally).

Restlessness and Regression As Reit (1985) explained, sibling rivalry is sometimes hidden behind restlessness and regression. Some behaviors such as thumb sucking, nail biting, sucking different objects, and introversion may be signs of restlessness among children who experience sibling rivalry. Some children who have a younger sibling regress into their babyhood, and they start to soil themselves and crawl again, suck their thumb, and forget their toilet training. According to their mothers' reports, in the weeks that followed the first month of the sibling's birth, older children started to babble and experience some sleeping and toileting troubles (Howe and Recchia 2008). Thus, restlessness and regression were identified as another sub-dimension of this study. This sub-dimension includes items such as wanting to be breastfed by the mother,

soiling one's clothes despite being able to go to the toilet on one's own, talking like a baby, and sucking things such as a blanket or buttons.

Negative Behavioral Changes In addition to restlessness and regression, some behavioral changes can be concomitant with sibling rivalry, such as changes in bedtime, nightmares (Magagna 2014), aggression (Ostrov et al. 2006; Volling et al. 2002), frequent nose picking, fears (Reit 1985), stuttering, and disobedience (e.g., not obeying commands like "be quiet" or "don't do that" (Yiğen 2005)). In this study, the subdimension of negative behavioral changes refers to the negative changes in the child's normal acts. After the review of the literature, behavioral changes that may result from sibling rivalry were identified and prepared as items in the scale. In this step, aside from previous studies, Yiğen's (2005) survey was used as a reference for the preparation of items.

Parental Partiality Another important point in sibling rivalry is parental partiality. According to the differential parental treatment theory, children demand that their parents treat siblings fairly. Not observing fairness in their parents' behavior triggers rivalry between siblings. Studies have revealed that parents form their behaviors and show their interest based on the birth order of their children (Webster 1998). Therefore, older children who feel threatened by the loss of their parents' attention (Volling et al. 2002) may perceive that their parents favor their siblings. In the present study, the parental partiality sub-dimension includes items regarding the complaints of the older child about the parent taking the sibling's side and items related to feeling anger when the parents look after the sibling. Items from the SRI of Boer et al. (1997), items from Webster's (1998) Sibling Envy and Jealousy Scale, and interview questions by Jones (1987) guided the preparation of items for this sub-dimension.

Competition Children's apprehension of parental partiality is related to their feeling of competitiveness (Furman and Buhrmester 1985). The term "rival" refers to the person who competes for an identical purpose or aim. Siblings' competition due to their desire to receive love and approval from adults, especially from their parents, makes them each other's rivals and constitutes one of the main reasons for sibling rivalry (Reit 1985). Therefore, in the scales measuring sibling rivalry and relationships, competition is treated as a sub-dimension (Furman and Buhrmester 1985; Jones 1987), and items concerning competition are included (Webster 1998). Similarly, in this study, considering these scales, competition was determined as the fifth construct, and items were adapted for preschool children. This factor includes items concerning the child measuring himself/herself against the sibling in terms of number of friends and knowledge base.

Warmth/Closeness In the current study, warmth/closeness, which includes eight reverse-coded items, was identified as the sixth sub-dimension of the PSRS as a sign of a positive relationship between siblings. This construct includes items concerning sharing toys and possessions with the sibling, teaching learned knowledge to the sibling, guiding the sibling in performing an action, trying to calm down the sibling when he/she cries, protecting the sibling against external dangers, and behaving in a way that expresses love toward the sibling.

3 Results

3.1 Results of the Pilot Study and Exploratory Factor Analysis

Exploratory factor analysis (EFA), which is the most valid method for measuring construct validity and attaining subscales that include coherent and fewer items (Tabachnick and Fidell 2001), was carried out to ensure the construct validity of the PSRS. Before the analysis, the Kaiser-Meyer-Olkin (KMO) test was conducted to check the suitability of the sample size for factorization. The value of KMO was .85. Given this finding, the sample size of the current study was interpreted as "good" for conducting factor analysis (Leech et al. 2005). Moreover, Barlett's test of sphericity was significant ($X^2 = 6116.558$, $p = .000$). Accordingly, the data were considered obtained from multivariate normal distribution.

After obtaining values that showed the appropriateness of the data for factor analysis, the principal components analysis (PCA) method of extraction, which aims to extract the maximum variance from the data set with each component (Tabachnick and Fidell 2001), was conducted. According to Çokluk et al. (2014), PCA enables researchers developing a scale to reveal the main sub-dimensions of the assessed subject. In PCA, a strong relationship between the emergent factors is not desired. On the other hand, when the researchers do not know the relationships among the factors, it is unreasonable to assume that the factors are completely independent of each other (Preacher and MacCallum 2003). Since the relationships among the factors were unknown in the present study, oblique rotation, specifically direct oblimin, which allows factors to be associated with each other (Çokluk et al. 2014), was employed.

To determine the number of factors, the "eigenvalue higher than 1" criterion, scree plot, and amount of variance explained were taken into consideration. At the end of the analysis, six factors had eigenvalues higher than 1. After examining these criteria, extracting six factors was deemed adequate. The total contribution of the factors to the common variance was 45.85 % (18.92 %, 8.51 %, 5.73 %, 5.02 %, 4.28 %, and 3.36 % for the six factors, respectively). In the social sciences, explained common variance from 40 % to 60 % is accepted as adequate for multi-factorial designs (Costello and Osborne 2005). Before conducting EFA, although regression and restlessness were planned as two different sub-dimensions independent of each other, items related to these sub-dimensions were collected under the same factor. After reviewing the content, since some items can be signs of both regression and restlessness (Item 37: stammer; Item 35: thumb sucking), these two sub-dimensions were regarded as one dimension.

For EFA conducted to determine the factor design of the PSRS, the threshold value for the factor loadings of the items was determined as .32 (Tabachnick and Fidell 2001). While two items (Item 29: Take him back to where he came from; Item 48: Showing extreme love for the guests who come to your home) were loaded on Factor 4 (Competition), these items were not appropriate for the content of that factor. Therefore, these items were removed from the scale. In addition, since three items (Items 6, 11, and 19) were not loaded on any factors and five items were scattered across more than one factor (Items 12, 13, 16, 32, and 33), they were excluded. Lastly, due to its low commonality value (lower than .20), Item 45 (Reluctance to go to kindergarten/nursery school) was deleted from the scale (Şencan 2005). Thus, 11 items were removed from the scale, resulting in the final version of the scale, which consists

Table 3 Factor design of preschool children sibling rivalry scale

Items	Factor Loadings					
	Parental partiality	Warmth/ Closeness	Behavioral changes	Competition	Antagonism	Regression and restlessness
Item28	.735	.023	−.070	.087	.121	−.183
Item26	.709	.145	−.231	−.063	.067	.003
Item27	.693	−.012	.090	.002	−.004	.095
Item25	.519	.113	−.034	.105	−.091	−.211
Item9	.484	.023	−.193	−.161	−.197	.083
Item24	.355	−.049	−.030	.064	−.041	.085
Item15	.045	.739	−.063	.118	.084	.062
Item14	.036	.727	.151	−.132	.024	.146
Item2	.075	.701	−.111	.117	.044	−.014
Item3	.206	.692	.008	.062	.008	−.067
Item4	.018	.600	.263	−.028	−.035	.218
Item1	−.172	.558	.160	−.087	−.396	.008
Item20	.028	.510	−.037	−.094	.046	−.136
Item10	−.044	.506	−.218	−.209	−.194	.087
Item46	−.006	−.056	.625	.135	.046	−.025
Item41	.056	.039	.598	.026	.101	.173
Item44	.267	.265	.591	−.084	.167	−.082
Item49	−.123	.146	.571	.119	−.234	−.218
Item47	−.114	.009	.524	.302	−.126	.180
Item43	−.113	−.367	.520	.085	−.078	−.049
Item42	−.096	.045	.494	.302	−.143	.152
Item39	−.072	.060	.473	.099	.183	−.079
Item40	.110	.208	.444	.175	−.103	−.178
Item37	.085	.147	.382	−.141	−.129	−.160
Item22	.111	−.081	.040	.824	.069	.023
Item21	.165	−.154	.054	.705	−.017	−.015
Item23	−.046	−.041	−.038	.681	.036	.068
Item7	−.052	.035	−.287	.085	−.700	.218
Item17	.071	.040	.127	.053	−.627	.046
Item18	.340	−.031	.071	−.118	−.548	.097
Item8	−.113	.094	−.213	.028	−.471	.211
Item5	.165	.014	−.160	.075	−.350	−.119
Item30	.086	.072	−.085	.048	−.030	.629
Item50	.055	.038	−.070	.157	.043	.610
Item36	.059	.075	.036	.118	−.134	.526
Item34	.039	−.014	−.293	−.135	−.171	.489
Item31	.324	−.082	.010	−.170	−.225	.481
Item35	.086	.072	−.085	.048	−.030	.474
Item38	.055	.038	−.070	.157	.043	.467

Table 4 Cronbach Alpha Values and Items of Each Factor

Factor name	Items	Cronbach Alphas
Negative behavioral changes	28, 30, 31, 32, 33, 34, 35, 36, 37, 38	.78
Warmth/Closeness	1, 2, 3, 4, 9, 10, 11, 14	.80
Parental partiality	8, 18, 19, 20, 21, 22	.82
Competition	15, 16, 17	.71
Antagonism	5, 6, 7, 12, 13	.67
Regression and restlessness	23, 24, 25, 26, 27, 29, 39	.63
PSRS		.87

of 39 items under six sub-dimensions. The factor loadings of the scale items (between .35 and .82) were higher than the threshold value, which was determined as .32 (Tabachnick and Fidell 2001). Hence, the factor loadings of the PSRS items can be interpreted as acceptable (see Table 3).

In addition, the coefficient of internal consistency for the PSRS was .87. The Cronbach's alpha coefficients for each sub-dimension were as follows: .78 for negative behavioral changes, .80 for warmth/closeness, .82 for parental partiality, .71 for competition, .67 for antagonism, and .63 for regression and restlessness (see Table 4).

3.2 Confirmatory Factor Analysis Results

The revised 39-item PSRS was administered to 203 parents to validate the factor structure that emerged from EFA. Confirmatory factor analysis (CFA) was conducted using LISREL 8.80 for Windows to confirm the model obtained from EFA. To test the PSRS model fit, the χ^2/sd (CMIN/df) likelihood ratio statistic, root mean square error of approximation (RMSEA), root mean square residual (RMR), standardized root mean square residual (SRMR), non-normed fit index (NNFI), and comparative fit index (CFI) were examined. Since the goodness-of-fit (GFI) and adjusted goodness-of-fit (AGFI) indexes are sensitive to sample size, scholars have advised against considering these indexes (Sharma et al. 2005). Thus, these indexes were not taken into consideration in this study.

As Kline (2005) stated, χ^2/sd values lower than 3 represent a perfect fit. Hence, the χ^2/sd ratio of 1.8 (1258.28/687 = 1.83) found in this study can be interpreted as a perfect fit. RMSEA values lower than .05 indicate a perfect fit, and RMSEA values lower than .08 represent a good fit (Byrne and Campbell 1999). The RMSEA value for this study, which was .06, indicates a good fit. For RMR and SRMR, while values lower than .05 represent a perfect fit, values lower than .08 represent a good fit (Brown 2006). In the current study, the RMR value of .01 indicates a perfect fit, and the SRMR value of .07 represents a good fit. Lastly, NNFI and CFI values above .90 represent a good fit (Jöreskog and Long 1993). In this study, the NNFI and CFI values were .90 and .91, respectively. Based on all of these findings, the fit indices reveal a good fit (χ^2/sd = 1.8, RMSEA = .066, RMR = .01, SRMR = .077, NNFI = .90, CFI = .91; see Fig. 1).
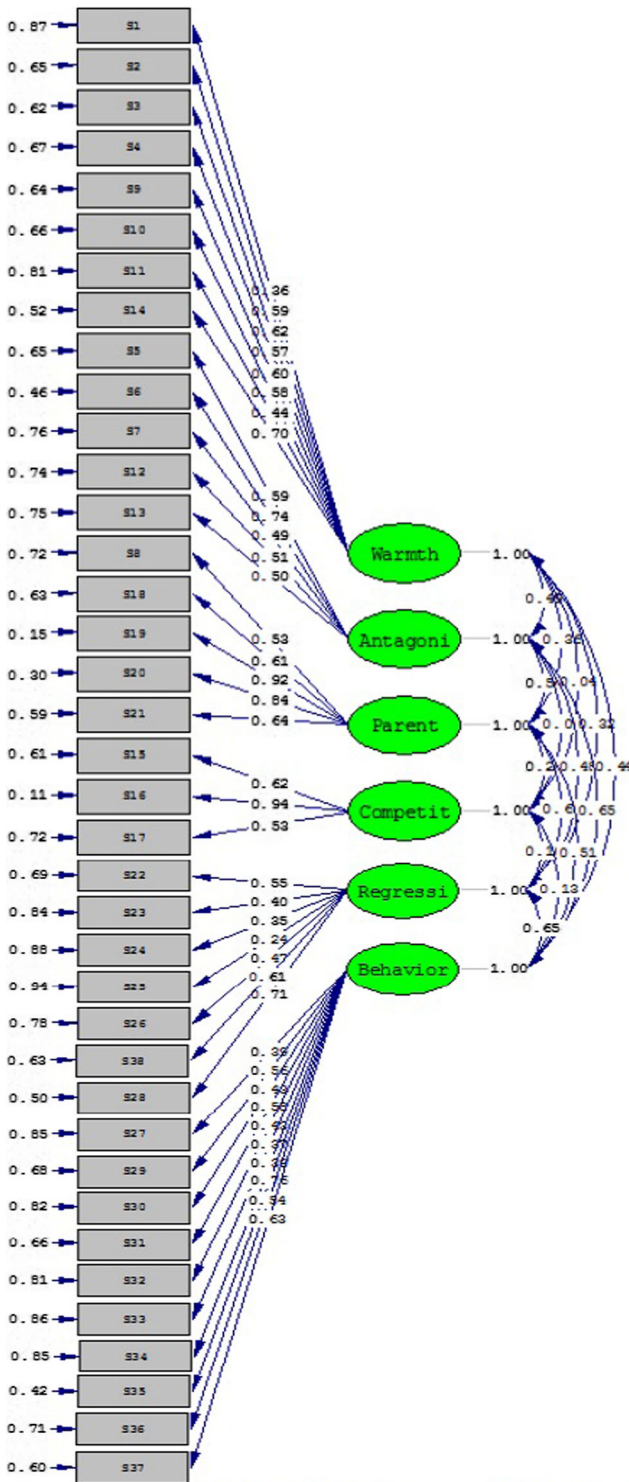
Fig. 1 Factor model of PSRS (CFA). Chi-square = 1258.28, df = 68, p = .000, RMSEA = 066

Table 5 Inter-correlations among sub-dimensions

Factors	1	2	3	4	5	6
1. Parental partiality	1.00					
2. Warmth/Closeness	.211[**]	1.00				
3. Negative behavioral changes	.442[**]	.298[**]	1.00			
4. Competition	.256[**]	−.079	.147[**]	1.00		
5. Antagonism	.512[**]	.276[**]	.393[**]	.113[**]	1.00	
6. Regression and restlessness	.439[**]	.267[**]	.490[**]	.141[**]	.257[**]	1.00

*Correlation is significant at the .05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

CFA also indicates the estimated correlations among the factors. According to Kline (as cited in DeVellis 2014), to ensure discriminant validity, estimated correlations among the factors should be lower than .85. In the current study, as presented in Table 5, all of the correlation estimates among the factors are lower than .85.

3.3 Results of Descriptive and Inferential Analyses

To better represent the sibling rivalry of 3–6-year-old preschool children on each sub-dimension of the PSRS, descriptive statistics were calculated (see Table 6). In addition, by considering contradicting findings exist in the literature regarding the effect of same-sex or opposite-sex siblings on sibling rivalry, One-way between-group analysis of variance (ANOVA) was conducted in order to investigate whether there was a significant difference in preschool children's sibling rivalry scores according to the gender composition of siblings.

Preschool children were divided into four groups according to their and their younger sibling's gender (Group 1 = Boys with younger sister; Group 2 = Boys with younger brother; Group 3 = Girls with younger brother; Group 4 = Girls with younger sister). To check the assumptions of ANOVA (outliers, normality, linearity, and homogeneity of variance), a preliminary analysis was performed. Skewness and kurtosis values, which were between +2 and -2, and histogram graphs indicated that normality

Table 6 Descriptive statistics for sub-dimensions of PSRS

Factors	M	SD	SE	Min.	Max.	Skewness	Kurtosis
Parent partiality	12.95	5.39	0.37	6	27	.643	−.439
Warmth/Closeness	21	5.99	0.42	8	40	.251	.024
Negative behavioral change	21.12	6.31	0.44	10	39	.462	−.214
Competition	5.02	2.92	0.20	3	15	1.578	1.757
Antagonism	13.48	4.13	0.29	5	23	.107	−.620
Restlessness and regression	13.3	3.80	0.26	7	28	.921	.797
PSRS	82.81	18.75	1.31	43.0	134.7	.320	−.511

Table 7 Bonferroni test results indicating mean scores at different gender compositions

	Mean scores					
	Parent partiality	Warmth/ Closeness	Negative behavioral change	Competition	Antagonism	Restlessness and regression
Group1	12.29 [a]	20.62 [a]	20.28 [a]	4.55 [a]	13.10 [a]	13.31 [a]
Group2	13.85 [a]	20.60 [a]	21.47 [a]	4.89 [a]	13.65 [a]	13.26 [a]
Group3	13.65 [a]	21.72 [a]	21.70 [a]	5.00 [a]	13.89 [a]	13.76 [a]
Group4	11.84 [a]	21.00 [a]	22.20 [a]	5.00 [a]	13.75 [a]	13.13 [a]

Means represented by same letters (a) do not significantly differ from each other (for any single test $p > .008$)

was not violated. In addition, the homogeneity of variances was checked using the Levene test value (greater than .05; Pallant 2005).

Results of the one-way between-group ANOVA did not indicate a significant difference at the $p < .05$ level in the total PSRS scores for the four groups, $F(3, 189) = 1.8$, $p = .13$. On the other hand, a significant difference was found in the parental partiality sub-dimension between the two groups, $F(3, 189) = 3.5$, $p = .01$. However, the mean scores of the groups indicated a small difference (effect size = .05). According to Cohen (1988), an eta-squared value lower than .06 can be interpreted as a small effect.

Shadish et al. (2002) encouraged researchers to avoid the fishing and error rate problem. They cautioned that repeated tests to detect a statistically significant result can result in finding an artifactual significance if it is not corrected in accordance with the number of tests that took place in the set. The Type I error rate for a sole test will increase and change as long as extra tests are performed (Maxwell and Delaney 1990). Shadish et al. (2002) suggested conducting the Bonferroni correction as a corrective procedure, which enables the distribution of the general Type I error rate among the tests within the set. The present study considered their suggestion and conducted the Bonferroni correction as a post-hoc test by keeping the overall p value criterion at .05 and adjusting the individual p value criterion for each single test by dividing overall p value criterion into the number of the comparisons (.05/6 = .008) (Green and Salkind 2005). Results of the Bonferroni test did not indicate a statistically significant difference among groups in terms of their scores on the PSRS sub-dimensions (see Table 7).

4 Discussion

Sibling rivalry is a topic that has been examined by a large body of research (Coles 2015; Hayes 2008; Kolak and Volling 2011; Phillips and Schrodt 2015; Volling et al. 2002) and has drawn the attention of researchers and families (Kolak and Volling 2011) for many years. However, as Volling et al. (2002) stressed, little is known about sibling rivalry in the preschool years. The review of related literature showed the need for a valid and reliable scale for research on preschool children's sibling rivalry and its related factors. Thus, this study presents an instrument to measure 3–6-year-old preschool children's sibling rivalry.

The findings show that the PSRS allows the collection of valid and reliable data to assess preschool children's sibling rivalry. The CFA results support the multi-dimensional constructs of the scale obtained through EFA. The final version of the PSRS consists of 39 items under six sub-dimensions: parental partiality, warmth/closeness, negative behavioral changes, competition, antagonism, and regression and restlessness.

The reliability coefficients of the PSRS sub-dimensions range from .63 for regression and restlessness to .82 for parental partiality. As Pallant (2005) stated, a Cronbach's alpha value above .70 can be accepted as adequate for an instrument. However, Pallant (2005) added that in sub-scales with less than 10 items, it is not surprising to find Cronbach's alpha values below .70. In the present study, the Cronbach's alpha values of the antagonism sub-dimension and the regression and restlessness sub-dimension were below .70. These lower Cronbach's alpha values may be related to the fewer items in these two sub-dimensions. The antagonism sub-dimension includes five items, and the regression and restlessness sub-dimension includes seven items. Although a Cronbach's alpha value threshold of .60 is acceptable for newly developed scales (Nunnally 1978) and these lower Cronbach's alpha values are reasonable for social studies (Tsai and Liu 2005), these lower values may be interpreted as a limitation of the PSRS. Besides, skewness and kurtosis values which were very close to the critical values (−2 and +2) (Hacıeminoğlu et al. 2014; Pallant 2007) signified significantly skewed distributions for some sub-scales of PSRS (e.g. competition) may constitute another limitation of the scale. Although, it is normal for the measures and scales in the social sciences and reflects the hidden nature of the measured construct rather than being a trouble upon the scale for Pallant (2005), future researchers should consider this issue while using the scale in their research.

The current study, in addition to analyzing the development of the PSRS, examined whether the gender composition of siblings creates a difference in their sibling rivalry scores. Findings revealed that preschool children with same and opposite sex siblings did not differ from each other in terms of their sibling rivalry. This finding contributes to the literature, which includes contradicting findings concerning sibling rivalry and siblings' gender composition. As Adler (1927/2014) & Reit (1985) emphasized, even in modern societies, having a baby boy is viewed as a blessing and as more practical due to economic reasons rather than having a baby girl. In the Turkish culture, especially in rural areas, gender apartheid exists. Girls do not have all the privileges that boys do, such as education. Moreover, girls sometimes undertake the care of their siblings (Bakış et al. 2009). Hence, in this study, the value attributed to boys in the Turkish culture or unfair treatment by the parents (Kolak and Volling 2011) may cause girls to think that they are no longer valued and may stimulate their rivalry with their siblings. On the other hand, the findings indicated no significant difference in PSRS scores among siblings with different gender compositions. This finding may be related to projects in Turkey for enhancing school attendance, especially among girls, and their active attendance to the social life. For instance, the project of "Haydi Kızlar Okula" initiated in 2003 and conducted with the cooperation of Turkish Ministry of Education and UNICEF is one of these projects. Indeed, these type of initiatives aim to strengthen girls by means of education, to improve their life skills and their join of society as productive individuals. In this way, it is thought that investing girls may speed up the compete against the poverty, inequality and gender apartheid in society and family

(Miraç 2015). Besides, when the child is comprehended as valuable economically, families prefer mostly boys, and boys are regarded as the factor which provide women with financial comfort (Kagitcibasi et al. 2001). However, the value given to the child lost its economical qualification, and as an individual each child is comprehended as valuable in today's society (Tezel-Şahin and Cevher 2007). Future studies conducted on different samples may shed light on the relationship between sibling rivalry and gender.

This study provides the following recommendations for further research: First, as Howe & Recchia (2008) emphasized, sibling relationships are affected by cultural differences. Thus, the PSRS can be translated into different languages and tested in different countries so that findings can be interpreted in terms of cultural differences. Second, the findings of this study are based on parents' reports about the sibling rivalry of their preschool children. In future research, qualitative studies including observations or interviews can be conducted to collect data from preschool children (e.g., Kolak and Volling 2011; Volling et al. 2002). In this way, it will be possible to consider children's feelings about their younger siblings. In addition, children's sibling rivalry can reflect on their behavior in the school environment, on their peer relationships (Gottesman 2013), and on their school achievement (Baydar et al. 1997). Thus, future educational research can deal with the effects of sibling rivalry on education environments. Finally, this study was conducted with parents of preschool children who were selected using convenience sampling. However, as Fraenkel et al. (2012) stated, convenience sampling has some disadvantages, which constitute a limitation for this study. Convenience sampling includes numerous probable sources of bias. For instance, only parents who were reached by the researcher were included in this study. In this way, findings obtained from the sample of this study did not present a representative information about the population. Moreover, in convenience sampling, some demographic characteristics of the sample that may affect the results may not be controlled. In this study, even if the construct was checked in terms of validity and reliability by means of pilot and main studies conducted with different samples, as Peterson and Merunka (2014) stressed, replications contribute to assess findings of the studies in terms of validity, reliability and generalizability. By considering the characteristics of the sample, as suggested by Fraenkel et al. (2012) and Peterson and Merunka (2014), future research could replicate this study with a number of similar samples to reduce the likelihood that the results obtained from this study were a one-time occurrence.

Based on the findings of this study, it can be concluded that the PSRS is a useful, valid, and reliable scale in measuring preschool children's sibling rivalry. The PSRS can be used in future research to understand the nature of sibling rivalry and to examine the factors that affect sibling rivalry.

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