

METHODS AND MEASURES

The Network of Relationships Inventory: Behavioral Systems Version

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This paper describes an alternative version of the Network of Relationships Inventory, which was designed to assess how frequently different relationships were used to fulfill the functions of three behavioral systems: attachment, caregiving, and affiliation. Psychometric and validation evidence is presented including: (a) high internal consistency for all scales and composites; (b) a second order factor structure of support and negative interactions for each relationship; (c) moderately high stability over a one year period; (d) moderate convergence among different reporters; (e) theoretically meaningful differences among different relationships; (f) moderate associations among different relationships; (g) associations with the original Network of Relationships Inventory; and (h) relations with observed interactions with mothers and friends.

Keywords: friendship qualities; parent–child relations; relationship quality; romantic relationships

Children and adolescents have a number of personal relationships with different people, such as parents and friends. Many questionnaires focus on the characteristics of specific kinds of relationships, but the Network of Relationships Inventory (NRI) was developed to examine the characteristics of a range of such relationships (Furman & Buhrmester, 1985). The most important feature of the NRI is that participants use the same set of items to describe their relationship with each of several members of their social network (e.g., mother, father, sibling, friend, romantic partner, and teacher). The investigator can then derive comparable scale scores (e.g., affection or conflict) or factor scores (support and negative interactions) for each relationship. This feature results in a matrix of “relationships by qualities” scores that has proven useful for two distinct purposes.

Originally, the NRI was designed to describe mean-level differences in scale scores among different types of relationships or across different ages or different groups. For example, DeRosier and Kupersmidt (1991) compared Costa Rican and United States children’s perceptions of their relationships with mothers, fathers, siblings, grandparents, teachers, and friends. The matrix of the NRI provides the opportunity to describe each type of relationship in terms of a profile of qualities, thus yielding a rich characterization of the similarities and differences among different relationships, ages, or groups.

The NRI has been used subsequently to measure individual differences in relationship qualities. Here, researchers have commonly examined how differences in overall support and negative interactions in relationships are associated with other individual outcomes (e.g., loneliness or depression) or relation-

ship outcomes (e.g., maintenance or dissolution of relationships). Because comparable support and negative interaction scores are derived for the different relationships, the investigator is able to compare the associations of the different relationships with the outcome variables (e.g., Laursen & Mooney, 2008).

As of 28 February 2009, over 900 individuals have requested a copy of the NRI. Moreover, it has been translated and used in a range of different cultures. Even though the measure has been broadly used, the only published paper on its validity was written over a decade ago, and it focused only on the assessment of friendship qualities (Furman, 1996). The purpose of this article is to present psychometric and validation evidence for a recently-developed version of the NRI.

The original version of the NRI – here referred to as the NRI-Social Provisions Version (NRI-SPV) – drew on Robert Weiss’ (1974) and Harry Stack Sullivan’s (1953) conceptualization of social needs and social provisions (Furman & Buhrmester, 1985). Respondents rate the extent to which different network members satisfy each of seven social needs (affection, reliable alliance, enhancement of worth, intimacy, instrumental help, companionship, and nurturance of other), and one negative characteristic of relationships (conflict). In a revised version of this measure, respondents rated three negative characteristics (conflict, criticism, and antagonism).

A newly developed second version – referred to as the NRI-Behavioral Systems Version (NRI-BSV) – is the focus of the current report. This version is based on a behavioral systems conceptualization of romantic and other close relationships (Furman & Wehner, 1994). Based on an integration of

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attachment theory (Ainsworth, 1989; Shaver & Hazan, 1988) and Sullivanian theory (Sullivan, 1953), the theory proposes that the attachment, caregiving, affiliative, and sexual/reproductive behavioral systems become central in romantic relationships; the first three systems are also expected to be key in other close types of relationships, although the degree to which a particular system is activated in a relationship varies by the type of relationship. The NRI-BSV assesses the extent to which adolescents' dyadic relationships with romantic partners, friends, and parents are each characterized by behaviors commonly involved in the attachment, caregiving, and affiliative behavioral systems. (The NRI-BSV does not assess the sexual system as most sexual behavior occurs in romantic relationships).

A behavioral system is a goal-corrected system that functions to maintain a relatively steady state between the individual and his/her environment (Bretherton, 1985). The system includes an appraisal process that indicates whether the set goal of the system is being met or not, emotions elicited by this process when the set-goal is met or not, and emotion-related actions and action-tendencies that correct the system when the set-goal is not met (Shaver & Hazan, 1988). For example, the set goal of the attachment system is to maintain some degree of proximity to an attachment figure in order to gain comfort and security (Bowlby, 1969). Seeking of security may involve seeking the other out as a safe haven when upset or distressed, or using the other person as a secure base to engage in non-attachment behaviors. Although these two types of behaviors are not necessarily indicative that a full-blown attachment bond exists, or even that the attachment system is necessarily activated, they are often attachment behaviors. In most Western cultures adolescents are expected to direct such behaviors toward mothers, and secondarily toward same-sex friends and eventually romantic partners (Furman & Wehner, 1997).

The caregiving system is conceptualized as reciprocal to the attachment system (George & Solomon, 2008). Here the set-goal is for a caregiver to provide comfort and security to the other person by either providing a safe haven or providing a secure base. In symmetrical relationships, such as those with friends and romantic partners, a person may both seek out the other as an attachment figure and serve as a caregiver for the other.

The affiliative system is based on humans' biological predisposition to interact with others for protection and cooperative food-sharing opportunities (Furman, 1999). Such interactions lead to companionship, cooperation, mutualism, reciprocal altruism, and social play. Through such interactions, youth develop the capacities to cooperate, collaborate with one another, and co-construct a relationship. In most Western cultures adolescents engage in affiliative behaviors most often with same-sex friends, and secondarily with romantic partners.

Thus, behavioral systems theory provides a different framework for conceptualizing relationship characteristics than Weiss' (1974) theory of the social provisions of interpersonal relationships. The purpose of the present study was to develop and validate a version of the NRI that allows comparisons of relationships with parents, friends, and romantic partners in terms of the frequency of different behaviors commonly associated with the attachment, caregiving, and affiliative behavioral systems. Such comparisons have important theoretical significance as individuals are hypothesized to turn to different relationships to meet the set goals of different behavioral systems. For example, adolescents in many cultures often

seek out the attachment figure of a parent to obtain security and comfort, whereas they seek out friends for affiliation. The relationships that are sought out are also likely to vary as a function of development and culture; for example, over the course of development, individuals in most Western cultures are increasingly likely to seek out romantic partners rather than friends for affiliation.

Thus, the NRI-BSV was developed as a way of comparing characteristics of different relationships using a behavioral systems framework. The NRI-BSV also included the NRI-SPV scales that assessed negative interactions. Importantly, we did not develop the NRI-BSV to replace the original NRI-SPV, as we believe the original NRI-SPV will continue to be a valuable instrument. Additionally, the NRI-BSV was also not designed to determine whether a relationship was or was not an attachment bond, nor was it designed to assess individual differences in secure and insecure attachment styles (see discussion section).

The purpose of the present study was to examine the psychometric properties and validity of the NRI-BSV. Therefore, we examined: (a) the factor structure of the measure; (b) the stability of the measure over a one year period; (c) associations among adolescents, mothers, and friends' perceptions of their relationships; (d) the ratings of different types of relationships; (e) the associations among different relationships; (f) associations with other scales from the original NRI-SPV; and (g) the links between self-perceptions and observed patterns of interactions.

Method

Participants

The participants were part of a longitudinal study investigating the role of relationships with parents, peers, and romantic partners on adolescent psychosocial adjustment. Two hundred 10th grade high school students (100 boys, 100 girls; M age = 15.27 years, range 14–16 years old) were recruited from a diverse range of neighborhoods and schools in a large Western metropolitan area by distributing brochures and sending letters to families residing in various zip codes, and to students enrolled in various schools in ethnically diverse neighborhoods.

Designed to be relatively representative of the ethnicity of the United States, the sample consisted of 11.5% African American, 12.5% Hispanic, 1.5% Native American, 1% Asian American, 4% biracial, and 69.5% White, non-Hispanics. With regard to family structure, 57.5% were residing with two biological or adoptive parents, 11.5% were residing with a biological or adoptive parent and a step parent or partner, and the remaining 31% were residing with a single parent or relative. The participants' mean scores did not differ from national norms on 12 of 13 measures of substance use, internalizing and externalizing symptoms (see Furman, Low, & Ho, 2009 for details).

The primary mother figure residing with the participant ($N = 197$) and a close friend ($N = 192$) nominated by the participant also participated. Almost all the mother figures were the participants' biological or adoptive parent (97%); a few were a stepmother or grandmother whom the participant had lived with for at least four years. Close friends were 13 to 18 years of age ($M = 15.41$, $SD = .87$), and their racial/ethnic identity and socioeconomic background were similar to the

focal adolescents'. The majority of adolescents and their peers were same-sex friends ($N = 166$); a minority were other-sex friends ($N = 25$). The mean duration of friendships was 4.21 years ($N = 3.12$). Ninety-nine percent of friendships were reciprocated based on adolescent and friend ratings of the relationship.

Procedure

For the purposes of the current study, the primary data were drawn from the first wave of data collection; test-retest data were drawn from the second wave of yearly data collection when almost all participants were in the 11th grade. All 200 adolescents participated in both waves of assessment. Adolescents participated in a series of laboratory sessions in which they were interviewed, completed questionnaires, and participated in videotaped interactions with different individuals. Sessions were counterbalanced and separated by at least a week.

The mother and a close friend nominated by the participant each took part in observational sessions with the focal participant, and each completed questionnaires about their relationship with the participant. The participant, mother, friend, and friends' parents provided written consent or assent. Participants, mothers, and friends were compensated financially for completing the questionnaires.

Measures

Network of Relationships Inventory: Behavioral Systems Version. The NRI-BSV is a 24-item questionnaire that assesses eight features of close relationships. The features included two new scales assessing attachment behaviors: (a) participant seeks safe haven; and (b) participant seeks secure base. Two new corresponding scales examined caregiving behaviors: (a) participant provides secure base; and (b) participant provides

safe haven. The companionship scale from the original NRI assesses affiliative behaviors. Three components of negative interactions are assessed using the existing NRI scales: (a) conflict; (b) antagonism; and (c) criticism. Items for each NRI-BSV scale are listed in the Appendix.

Participants answered all questions about their relationships with a mother figure ($N = 196$), a father figure ($N = 185$), a same-sex friend ($N = 196$), an other-sex friend ($N = 171$), and their most important romantic relationship in the last year ($N = 112$). Mothers answered similar questions about their relationship with the participating adolescent and about their perceptions of the father's relationship with the adolescent. Friends answered questions about their friendship with the participant, and the participant's romantic relationship.

Participants rated how much each feature occurred in each relationship using five-point Likert scales (1 = "Little or None", 2 = "Somewhat", 3 = "Very Much", 4 = "Extremely Much", 5 = "the Most"). Scale scores are derived by averaging the items. The internal consistencies of all NRI-BSV scales for all relationships were satisfactory (see Table 1).

Network of Relationships Inventory: Social Provisions Version. Participants also completed the intimacy, instrumental help, and affection scales from the NRI-SPV so that comparisons between the two versions of the NRI could be made. These scales are identical in form to the NRI-BSV scales and were embedded in the NRI-BSV questionnaire in this study.

Dyadic interactions. Adolescents were videotaped interacting with their mother in one session and interacting with their friend in another session. Each session consisted of a series of six five-minute interactions designed to assess attachment, caregiving, and affiliative behaviors. As a warm-up task, the pair planned a celebration. In the next two tasks, each person discussed a problem he or she was having outside of their relationship. In the fourth task, the pair discussed a personal

Table 1

Means, standard deviations, and internal consistencies of scales and factors on NRI-BSV and NRI-SPV

	Mother (N = 199)			Father (N = 192)			S Friend (N = 198)			O Friend (N = 174)			Romantic (N = 119)		
	M	SD	α	M	SD	α	M	SD	α	M	SD	α	M	SD	α
Scale															
Seek safe haven	3.19 _a	1.27	.92	2.40 _c	1.23	.91	3.25 _a	1.28	.91	2.89 _b	1.15	.88	2.85 _b	1.28	.91
Seek secure base	3.88 _a	.94	.79	3.44 _b	1.14	.84	3.43 _b	1.06	.80	3.15 _c	1.06	.81	3.01 _c	1.06	.83
Provide safe haven	2.62 _b	1.11	.89	1.90 _c	.92	.86	3.12 _a	1.24	.92	2.65 _b	1.07	.86	2.80 _b	1.19	.92
Provide secure base	3.21 _b	1.08	.81	2.82 _c	1.15	.82	3.53 _a	1.03	.79	3.33 _b	1.02	.72	3.30 _b	1.08	.84
Companionship	2.86 _c	1.11	.88	2.45 _d	1.07	.86	3.68 _a	1.06	.87	3.03 _{bc}	1.06	.84	3.17 _b	1.23	.90
Conflict	2.30 _a	.98	.89	2.24 _a	1.00	.88	1.62 _c	.70	.79	1.46 _d	.56	.76	1.83 _b	.78	.78
Criticism	1.99 _a	.90	.82	1.97 _a	1.00	.86	1.74 _b	.81	.79	1.53 _d	.64	.71	1.64 _c	.75	.76
Antagonism	2.55 _a	.99	.82	2.36 _b	.92	.75	1.85 _c	.84	.79	1.60 _d	.67	.74	1.96 _c	.80	.75
Factors															
Support	3.16 _b	.95	.94	2.60 _c	.97	.95	3.40 _a	1.00	.95	3.02 _b	.96	.95	3.04 _b	1.04	.96
Negative interaction	2.28 _a	.90	.93	2.17 _a	.86	.93	1.75 _b	.72	.90	1.53 _c	.58	.89	1.81 _b	.70	.90
NRI-SPV scales															
Intimacy	2.84 _c	1.22	.88	2.06 _d	1.09	.88	3.64 _a	1.16	.85	3.10 _b	1.15	.86	3.17 _b	1.20	.86
Affection	4.40 _a	.81	.89	3.95 _b	1.08	.90	3.56 _c	.99	.82	3.38 _d	.93	.81	3.39 _{cd}	1.14	.91
Instrumental help	3.50 _a	1.13	.86	2.98 _c	1.23	.88	3.22 _b	1.07	.83	2.83 _c	1.04	.78	2.74 _c	1.09	.85

Note. S friend = same-sex friend; O friend = other-sex friend. Relationships with different subscripts differ significantly, $p < .05$.

goal that the adolescent was working toward. Next, the two discussed a problem inside their relationship, which both had selected as a significant conflict. Finally, as a wrap-up task, the dyad discussed past good times in their relationship. In the present study, the warm-up and wrap-up segments were not coded. To minimize halo effects, each segment was coded at a different time.

Interactions were coded using the Interactional Dimensions Coding System (IDCS; Julien, Markman, & van Widenfelt, 1986), which was originally designed to assess adult couples' interactions during a problem discussion and was modified slightly to make the scales more applicable to an adolescent population. For each task, coders rated each person's affect and behavior separately on 10 individual scales and coded the dyad's characteristics on five scales. Each observational code was rated using a nine-point scale. In the present study, we examined the 10 coded scales concerning the focal adolescents' behavior. Principal axis factor analysis with oblique rotation revealed that the 10 adolescent behavior scales loaded on three factors: (1) On Task, comprised of problem-solving and task avoidance (reverse coded); (2) Conflict, containing conflict, dominance, and denial; and (3) Communication Skills, consisting of communication skills, support-validation, positive affect, negative affect (reverse coded), and withdrawal (reverse coded). Composites were calculated by averaging across scales and tasks. We also examined the five scales which directly assessed the dyads' characteristics: (a) positive escalation; (b) negative escalation (reverse coded); (c) mutuality; (d) relationship quality; and (e) relationship satisfaction. A principal axis factor analysis with oblique rotation revealed that all the dyadic scales loaded on a single factor. Accordingly, the five dyadic scales were averaged to derive a composite score of dyadic positivity.

Interactions were rated by coders naive to other information about the participants. Inter-rater agreement was checked on 22% of all tasks coded. Intraclass correlation coefficients for composites ranged from .69 to .83.

Results

Preliminary analyses and descriptive information

We examined all variables to determine if the variables were normally distributed. Outliers were adjusted to fall 1.5 times the interquartile range below the 25th percentile or above the 75th percentile (e.g., to the whiskers in Tukey's [1977] boxplot). All the resulting variables had acceptable levels of skew and kurtosis. Table 1 contains the means and standard deviations of the NRI-BSV scale scores.

Factor structure

Based on prior research (see Furman, 1996), we expected to find a hierarchical factor structure in which the NRI items pertaining to a relationship would load on eight first-order factors representing the scales, which in turn would load on two second-order factors: (a) support which consisted of the one affiliation, two attachment, and two caretaking factors; and (b) negative interactions which consisted of conflict, antagonism, and criticism factors. We conducted separate confirmatory factor analyses for ratings of each type of relationship. We used Amos 5.0 to estimate the models (Arbuckle, 2003).

We assessed goodness of fit for each model by examining the comparative fit index (CFI) and root mean square error of approximation (RMSEA); according to conventional guidelines, a CFI of .90 and an RMSEA of .08 or less are considered to be a reasonable fit (Kline, 2005).

The models provided satisfactory fits to the data (range = $\chi^2(243, N = 174) = 384.86, p < .001$ to $\chi^2(243, N = 199) = 534.31, p < .001$, CFIs = .91 to .96; RMSEAs = .05 to .08). All items loaded highly on their scales and all scales loaded highly on the appropriate factor (see Table 2). The Support and Negative Interaction factors were minimally related ($r = -.30, p < .001$ to $r = .07, p = .86$). For subsequent analyses, higher-order factor scores were calculated by averaging the scores of scales loading on the factor.

To further test the idea of a hierarchical factor structure, we compared these hierarchical models to models in which there were no first-order scale factors and items loaded directly on a Support or Negative Interaction factor. These models provided significantly poorer fits to the data than the hierarchical models (range = $\Delta\chi^2(8, N = 174) = 55.08, p < .001$ to $\Delta\chi^2(8, N = 199) = 85.6, p = .001$). We also compared the hierarchical model to a model in which there were only first-order scale factors and not the two second-order factors; in these models, the scales were allowed to covary. These models also provided significantly poorer fits to the data than the hierarchical models (range = $\Delta\chi^2(9, N = 198) = 1017.09, p < .001$ to $\Delta\chi^2(9, N = 192) = 1064.47, p < .001$). Thus, these model comparisons provided consistent support for the expected two-level hierarchical factor structure of the NRI-BSV.

Stability over time

Next, we examined the stability of scores over the one year period from the 10th to 11th grade (see Table 3). The support and negative interaction scores were relatively stable in relationships with parents. Similarly, these scores were relatively stable for those participants who described the same friendships in the two grades. Only a few participants had the same romantic relationship at the two time points, precluding the possibility of examining stability in these relationships.

Table 2
Factor loadings

	<i>Item loadings on scale</i>		<i>Scale loadings on factor</i>	
	<i>Mean</i>	<i>Range</i>	<i>Mean</i>	<i>Range</i>
Seek safe haven	.87	.79-.94	.94	.89-.97
Seek secure base	.79	.68-.86	.91	.85-.96
Provide safe haven	.86	.80-.93	.86	.73-.94
Provide secure base	.77	.61-.88	.93	.89-.98
Companionship	.83	.75-.90	.88	.80-.93
Conflict	.79	.64-.91	.98	.94-1.00
Criticism	.75	.64-.87	.90	.83-.97
Antagonism	.76	.64-.88	.99	.97-1.00

Note. The first two columns of numbers present the means and ranges of the loadings of the items on the scales in the far left column. The next two columns of numbers present the means and ranges of the loadings of the scales in the far left column on the second-order factors of support and negative interaction.

Table 3
Stability of scores over one year

	Mother (N = 182)	Father (N = 171)	S Friend (N = 90)	O Friend (N = 57)
Scales				
Seeks safe haven	.70**	.63**	.72**	.58**
Seeks secure base	.61**	.66**	.43**	.65**
Provides safe haven	.67**	.61**	.71**	.68**
Provides secure base	.56**	.59**	.49**	.63**
Companionship	.67**	.60**	.44**	.66**
Conflict	.54**	.43**	.63**	.64**
Criticism	.51**	.51**	.44**	.43**
Antagonism	.49**	.40**	.53**	.67**
Factors				
Support	.70**	.67**	.66**	.75**
Negative interaction	.55**	.49**	.58**	.65**

Note. ** $p < .01$. S friend = same-sex friend; O friend = other-sex friend.

Convergence among reporters

Next, we examined the correspondence among different raters' perceptions of a relationship (see Table 4). Adolescents' and mothers' perceptions of support and negative interactions in their relationship were significantly related. Similarly, adolescents' and mothers' perceptions of the adolescents' relationship with the father were significantly related. Adolescents and their participating friends' perceptions of their relationship were significantly related. Adolescents' and their friends' perceptions of the adolescents' romantic relationship were also significantly related.

Differences in relationships

Next, we examined whether the mean levels of scale and factor scores varied across the five different relationships. Missing data are not permitted in repeated measures ANOVA, and only 46.5% of the participants had all five types of relationships. Accordingly, we conducted the equivalent of one-way repeated

measures ANOVAs using multilevel modeling, which does permit missing data (see Kenny, Bolger, & Kashy, 2002 for a detailed description of this technique). The models included different sets of four dummy-coded orthogonal contrasts of different relationships at level 1; for example, one model contained contrasts between: (1) relationships with mothers versus those with fathers; (2) same- versus other-sex friendships; (3) relationships with fathers and mothers versus same- and other-sex friendships; and (4) romantic relationships versus the other four relationships. If this model with the contrasts had a lower deviance (i.e., a better fit) than a baseline model without the contrasts, it would indicate that there was an omnibus effect of relationship type. Significant omnibus effects were found for all NRI scales and factors (difference in deviance = 72.67 to 161.56, $ps < .001$).

To determine the nature of the significant relationship effects, we examined whether each contrast comparing a particular pair of relationships was significant (e.g., same-versus other-sex friendships). We did not examine contrasts involving more than two relationships (e.g., romantic relationships versus the other four relationships) as they were only included to determine if there was an omnibus effect. Table 1 presents the mean scores of the five relationships, indicating which means differed significantly (i.e., whether the associated contrast was significant). In general, the pattern of findings on the five behavioral system scales was highly consistent with our expectation. Adolescents turned most often to mothers and same-sex friends for a safe haven; for a secure base, they turned to mothers most often, followed by fathers and same-sex friends. They provided a safe haven most often for same-sex friends, followed by romantic partners and other-sex friends. Similarly, they served as a secure base most often for friends, followed by romantic partners, other-sex friends, and mothers. Finally, they sought out companionship most often from same-sex friends, followed by romantic partners.

Correlations among relationships

In theory, the characteristics of one type of relationship are influenced by carryover from experiences in other relationships and by the unique history of experiences with the specific

Table 4
Correlations between adolescent self-report ratings and other-report ratings of adolescents' relationships

	Mother rate Mother-adolescent	Father rate Father-adolescent	Friend rate Friend-adolescent	Friend rate Adolescent-romantic
Scales				
Seeks safe haven	.43**	.34**	.57**	.49**
Seeks secure base	.25**	.38**	.25**	.31**
Provides safe haven	.34**	.21*	.62**	.50**
Provides secure base	.27**	.29**	.27**	.39**
Companionship	.45**	.41**	.55**	.46**
Conflict	.46**	.42**	.35**	.19
Criticism	.37**	.34**	.29**	.48**
Antagonism	.42**	.25**	.31**	.29*
Factors				
Support	.43**	.40**	.54**	.47**
Negative interaction	.49**	.36**	.34**	.37**

Note. ** $p < .01$; * $p < .05$. The top row of each column indicates whose report of which relationships is being compared to the adolescent's perception of that relationship.

Table 5
Correlations between corresponding factors in different relationships

Relationships	Support	Negative interaction
Mother-father	.57**	.42**
Mother-same-sex friend	.36**	.28**
Mother-other-sex friend	.48**	.30**
Mother-romantic partner	.15	.19*
Father-same-sex friend	.21**	.15*
Father-other-sex friend	.32**	.17*
Father-romantic partner	-.05	.01
Same-sex friend-other-sex friend	.59**	.56**
Same-sex friend-romantic partner	.40**	.27**
Other-sex friend-romantic partner	.25*	.14

Note. ** $p < .01$; * $p < .05$. $N_s = 97$ to 194.

partner (Furman & Wehner, 1994). Table 5 presents the correlations of corresponding factor scores in different relationships. Support and negative interaction scores for relationships with mother and father were highly related, as were scores for same-sex and other-sex friendships. The associations between relationships with parents and those with friends were moderate. Romantic relationship scores were moderately related to friendship scores, but not related to parent-adolescent relationships.

Correspondence with the NRI scales

We administered three scales from the original NRI-SPV questionnaire (affection, intimacy, and instrumental aid) which have loaded on a support factor in previous analyses of the original NRI-SPV (Furman, 1996). To determine the degree of equivalence between a support factor based on these three scales and a support factor based on the five NRI-BSV scales, we compared two sets of models. In both sets of models we modeled 11 first-order factors, each of which was defined by three items loading on a particular scale. The two sets of models, however, differed in the nature of the second-order factors. In the first set of models, the eight first-order factors based on the NRI-BSV and NRI-SPV support scales were modeled as loading on a single second-order support factor, and the three first-order factors based on the negative interaction scales were modeled as loading on a second-order negative interaction factor; the two second-order factors were allowed to covary. In the second set of models, we modeled a second-order BSV support factor based on the five NRI-BSV support scales, another second-order SPV support factor based on the three NRI-SPV support scales, and finally a second-order negative interaction factor based on the three negative interaction scales; the three second-order factors were allowed to covary.

Four of the five models with a single support factor and a negative interaction factor fit the data (range = $\chi^2(483, N = 174) = 876.31, N < .001$ to $\chi^2(243, N = 192) = 998.12, p < .001$, CFIs = .90 to .92, RMSEAs = .06 to .08); the fit for romantic relationships was poorer ($\chi^2(483, N = 119) = 935.44, p < .001$, CFI = .85, RMSEA = .09), which may have resulted from the relatively low number of participants for a model with this many parameters. None of the models with two support factors and a negative interaction factor were admissible because all had nonpositive definite matrices; an examination of the inadmissible solutions revealed that the correlations

between the two support factors were estimated to be greater than 1.00. This problem can occur when the correlations among indicators of two latent factors are greater than the correlations among the indicators of one latent factor (Wothke, 1993). Thus, it appears that one cannot differentiate between a support factor for the NRI-BSV and a support factor for the NRI-SPV.

In order to further examine the relations between the support scales for the two versions, we derived a composite score of the five BSV support scales and a composite score of the three NRI-SPV support scales for each relationship. The correlations between the two composites for each relationship were also very high ($M r = .91$, range = .88 to .93, all $p_s < .001$). Taken together, these findings suggest that the same second order support factor is assessed in the two versions of the NRI.

Whereas we found very high correspondence between the NRI-BSV and the NRI-SPV at the level of the second-order support factor, we expected that the scales of the two versions would capture unique mean level patterns of differences across different types of relationships. To test this idea, we examined mean differences among the relationships on the three NRI-SPV scales using the multilevel modeling equivalent of repeated measures ANOVAs described previously. The results of these comparisons are reported in Table 1. Importantly, the pattern of mean differences for each of these three scales differs from the pattern of differences for each of the scales on the NRI-BSV. Thus, the two versions of the measure appear to assess very similar, if not the same, constructs at the second-order factor level, but yield unique information at the scale level.

Correlations with observed behavior

Next, we examined the pattern of relations between coders' ratings of observed interactions and adolescents' ratings of their relationships with mothers and friends (see Table 6). Observed communication skills with mother and dyadic positivity were positively related to perceptions of support. Communication skills were negatively related to perceptions of negative interactions, whereas observed conflict was positively related to perceptions of negative interaction. On-task behavior was negatively related to perceptions of negative interaction.

Table 6
Correlations between NRI composites and observations with mothers and friends

	Communication	Conflict	On-task	Dyadic positivity
Mother adolescent relationship				
Support	.22**	-.08	.07	.22**
Negative interaction	-.36**	.38**	.25**	-.34**
Friendships				
Support	.21**	.06	.13	.22**
Negative interaction	-.15*	.16*	-.21**	-.08

** $p < .01$; * $p < .05$. $N_s = 179$ to 185.

The pattern of relations between adolescents' observed interactions with friends and their perceptions of these friendships was similar to the pattern of relations between adolescents' observed interactions with mothers and their perceptions of relationships with mothers.

Discussion

As noted previously, we believe that the original version of the Network of the Relationship Inventory has proven to be a useful measure. The results presented in this article suggest that the Behavioral Systems Version of this instrument may also be useful. The psychometric properties of the measure were good. Scores on all scales had sufficient variability and the internal consistencies of the scales and factors were all good. The second-order factor structure of support and negative interaction dimensions was the same as that obtained with the original NRI-SPV (Furman, 1996). The stability of the scores over a year was relatively high, as one would expect from long-standing relationships.

In general, moderate to high degree of convergence occurred between the focal adolescents' and others' perceptions of the adolescents' relationships, suggesting at least moderate consensus between relationship partners' perceptions of their relationships. The convergence of reports was not perfect as one would expect adolescents and others to have somewhat different perspectives on a relationship (see Furman, Jones, Buhrmester, & Adler, 1988). Adolescents' perceptions of their relationships were also associated with their observed interactions with friends and with mothers, providing validation support for both the NRI-BSV and the observational measure. These associations were modest to moderate in size as one would expect theoretically when comparing an insider's perception of a relationship to an outsider's assessment (see Furman et al., 1988).

Differences among relationships

Similar to the aim in developing the original NRI, a primary aim in developing the NRI-BSV was to create a research instrument that allowed comparisons of different types of relationships in terms of theoretically important relationship features. In this case, the NRI-BSV was designed to allow us to document how relationships with parents, friends, and romantic partners are both similar to and different from one another in terms of behaviors that typically reflect the different behavioral systems. The findings of the current study clearly illustrate the validity of the NRI-BSV scales for making such theoretical comparisons. Specifically, mothers were most often sought out as a secure base, whereas mothers and same-sex friends were most often sought out as a safe haven. These findings are consistent with research showing that a parent is likely to serve as the primary attachment figure at this age (Hazan & Zeifman, 1994); moreover, the fact that same-sex friends were sought out as often as mothers as a safe haven, but not as a secure base, is consistent with the idea that the safe haven function of attachment transfers to peers before the secure base function (Hazan & Zeifman, 1994). It is also noteworthy that same-sex friends were sought out more often as a safe haven and as a secure base than a romantic partner was. Attachment theorists have emphasized how the primary attachment figure transfers from being a parent to a romantic

partner, but the present results suggest that we also need to consider the role friends play during adolescence.

With regard to caregiving, adolescents served as a safe haven and secure base most frequently for same-sex friends. Descriptions of the development of the caregiving system have discussed the role caring for a younger sibling or infant plays (George & Solomon, 2008); the present findings suggest that caregiving of peers may also play a role, perhaps especially for the caregiving that subsequently occurs in committed romantic relationships. Consistent with behavioral systems theory (Furman, 1999), same-sex friends and then other peers were sought out most often for companionship.

Taken together, the findings illustrate the importance of making mean level comparisons at the scale level and not just the second-order factor level. If we had simply compared the overall level of support in different relationships, we would have concluded that same-sex friends were the most supportive, yet this is not always the case at the level of specific scales. Moreover, we would have concluded that mothers, romantic partners, and other-sex friends were comparable in levels of support, yet this too is not the case in terms of specific scales.

Although the various relationships were clearly perceived differently, ratings of support in the different relationships tended to be moderately or highly correlated with each other. This pattern is consistent with behavioral systems theory's simultaneous emphasis on the carryover of expectations across relationships and the differences in the experiences one has in different relationships (Furman & Wehner, 1994). Interestingly, scores for romantic relationships were only associated with scores for friendships and not with relationships with parents, underscoring the role peers may play in the emergence of romantic relationships (Furman, 1999; Furman, Simon, Shaffer, & Bouchev, 2002).

Attachment bonds and relational views

Two of the NRI-BSV scales assess the extent to which attachment behaviors occur in particular relationships. It is important to emphasize that the NRI-BSV is not designed to determine if one has a full fledged attachment bond. For example, if an adolescent seeks out a friend at a time when distressed, she may be engaging in attachment behaviors, but she may not have a full fledged attachment bond to the friend (see Ainsworth, 1989; Cassidy, 1999). In fact, it is unlikely that most adolescents have fully fledged attachment bonds with a romantic partner at this age, as most of these relationships are relatively short-lived (Furman & Wehner, 1997). For example, in the present study, the mean length was 5.6 months, and 87% of them were less than a year in length.

These caveats notwithstanding, we believe that the question of whom one has or does not have an attachment bond with is not the key issue. The close relationships individuals have with various people have some similarities and differences with one another. We need to develop theories which can account for the processes underlying such similarities and differences. For example, if one wants to argue that most friendships are not attachment bonds, one still has to account for the secure base and safe haven behaviors that characterize these relationships. Conversely, if one argues that friendships are attachment bonds, one has to account for the differences between these and other attachment bonds (Furman & Wehner, 1994). By examining behaviors relevant to the different behavioral

systems and identifying the similarities and differences across relationships, the NRI-BSV can contribute to the development of such theories.

In a related vein, it is important to emphasize that the attachment scales also do not assess whether the representation of a particular attachment relationship is secure or not. The NRI-BSV does not measure the degree of security of representations and instead examines perceptions of attachment behaviors. In fact, we have developed other measures specifically to assess representations of security. The Behavioral Systems Questionnaire (Furman & Wehner, 1999) assesses self-rated attachment security, whereas the Friendship/Romantic Interview (Furman, 2001) is an interview assessment procedure similar to the Adult Attachment Interview (George, Kaplan, & Main, 1985). In theory, attachment behaviors and attachment security are not related to each other in a one-to-one fashion. One might expect a person with a secure representation of a particular relationship to engage in more safe haven and secure base behavior with that individual than a person with a dismissing representation of that particular relationship; on the other hand, preoccupied individuals may also seek the other as a safe haven or secure base relatively often.

Selection of instrument

If one is interested in assessing social support, a number of different measures of social support are available (see Wills & Shinar, 2000). The NRI has several distinct features that may make it appropriate to use in some circumstances. Most instruments either provide a one-dimensional measure of support or assess a small set of functions support may provide (e.g., instrumental, emotional, or informational). Few measures differentiate among different sources of support, and those that do typically differentiate between different groups of relationships, such as family members or friends. We believe that the NRI is one of the few measures that examines specific relationships, as well as different facets of relationships, both supportive and negative. Finally, it is one of the few measures that has been used with children, adolescents, and adults.

With the development of the NRI-BSV, two versions of the NRI exist, and some individuals may wonder which version to use. The two versions share some scales and have similar psychometric properties. Analyses suggest that they both measure the same second-order support factor as well as the same negative interaction factor. Thus, if one is simply interested in assessing support and negative interactions in various relationships, one should obtain similar results with the two measures. One measure may be preferred, however, depending on whether the underlying conceptualization of behavioral systems or social provisions is more consistent with the purpose of the study.

The choice is particularly important if one is interested in comparing the mean levels of particular features across different relationships, cultures, or other groups. As noted previously, important mean-level differences may occur at the scale level that may not be apparent at the second-order factor level. Only two of the 11 scales on the NRI-SPV and NRI-BSV had the same pattern of mean differences among the relationships. Thus, the results regarding mean differences are likely to vary depending on which version of the measure is used. In this case, we believe the choice should be dictated by the theoretical framework and questions being asked. If one is interested in examining features related to the behavioral

systems of attachment, caregiving, and affiliation, then the Behavioral Systems version would be appropriate. If one is interested in Weiss' (1974) social provisions, such as admiration or instrumental help or reliable alliance, then the original version would be appropriate.

Similarly, some investigators may be theoretically interested in a particular feature, such as providing a secure base, and may want to select the version that allows them to examine the associations with that particular scale. We would encourage the examination of specific scales to be theory-based, as exploratory correlations for multiple scales would substantially increase the number of statistical tests, which would likely result in Type 1 errors.

Limitations and future directions

The present study provides encouraging psychometric and validation evidence for the Behavioral Systems Version of the NRI. At the same time, several topics warrant further examination. Only one scale associated with affiliation was included, and thus additional indices would be beneficial. For example, reciprocal altruism and play are other potential indices of the affiliative system (Furman, 1999). Other indices of attachment and caregiving behavior, such as separation protest, could also be interesting additions.

The current study examined relationships with parents, friends, and romantic relationships. It would be important to examine other relationships, such as those with siblings, teachers, or relatives, as has been done with the original version of the NRI (e.g., Furman & Buhrmester, 1985).

Psychometric and validation studies of different age groups would be important for several reasons. Theoretically, we would expect changes in the frequency in which different persons engage in behaviors commonly associated with the attachment, caregiving, and affiliative system. Such changes should be evident in comparisons of the same relationship over time and comparisons of different relationships. For example, we expect that, as they grow older, individuals in most Western cultures increasingly engage in attachment, caregiving, and affiliative behaviors with romantic partners, and they would increasingly turn to romantic partners as compared to friends (Furman & Wehner, 1994). Such developmental research would also indicate whether the measure is appropriate for different ages. Similarly, studies of different subgroups and cultures should yield important information about cultural differences and the nature of relationships and the behavioral systems.

In summary, the present study found the NRI-BSV to have good psychometric properties. We also found convergence among multiple reporters, associations with the original NRI-SPV, associations with observational data, and differences among perceptions of various relationships that were consistent with behavioral systems theory. It is hoped that this new version of the NRI will prove valuable to social scientists.

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Appendix: List of items

SUPPORT SCALE ITEMS

Seeks safe haven

- How much do you seek out this person when you're upset?
- How much do you turn to this person for comfort and support when you are troubled about something?
- How much do you turn to this person when you're worried about something?

Seeks secure base

- How much does this person encourage you to try new things that you'd like to do but are nervous about?
- How much does this person encourage you to pursue your goals and future plans?
- How much does this person show support for your activities?

Provides safe haven

- How much does this person turn to you for comfort and support when s/he is troubled about something?
- How much does this person turn to you when s/he is worried about something?
- How much does this person seek you out when s/he is upset?

Provides secure base

- How much do you encourage this person to try new things that s/he would like to do but is nervous about?
- How much do you encourage this person to pursue his/her goals and future plans?
- How much do you show support for this person's activities?

Companionship

- How much do you and this person spend free time together?
- How often do you and this person go places and do enjoyable things together?
- How much do you and this person play around and have fun?

NEGATIVE INTERACTION SCALE ITEMS

Conflict

- How much do you and this person get upset with or mad at each other?
- How much do you and this person disagree and quarrel?
- How much do you and this person argue with each other?

Criticism

- How much do you and this person say mean or harsh things to each other?
- How often do you and this person point out each others' faults or put each other down?
- How much do you and this person criticize each other?

Antagonism

- How much do you and this person hassle or nag one another?
- How much do you and this person get on each other's nerves?
- How much do you and this person get annoyed with each other's behavior?