



# RSA Reactivity in Adolescents: Gender Differences and Implications for Friendship Quality

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## INTRODUCTION

- Friendships are important relationships during adolescence.
- Research is limited on the relations between physiological functioning and friendship functioning (Murray-Close et al., 2013).
- Respiratory sinus arrhythmia (RSA) reactivity indexes changes in parasympathetic nervous system activity and has important implications for functioning in close relationships (Porges 2001; 2009).
  - Decreases in RSA in response to stressors is thought to reflect adaptive regulation (Beauchaine, 2001).
  - Although research has not examined RSA reactivity in relation to adolescent friendships, one study found that adults who were primed to think about friendships demonstrated greater RSA reactivity to stress when they had high quality friendships (Carlisle et. al, 2012).
- Previous studies have examined RSA and its relationship to adolescent friendships and found that priming new relationships with positivity was associated with significant RSA decreases during stress.
  - This implies that existing relationships with positive friendship quality could have similar effects on RSA reactivity and provide an indicator of how adolescent friendships impact physical and emotional health.
- This study aims to examine the effects of positive and negative friendship quality on adolescents’ RSA reactivity during friendship interactions.

## METHOD

### Participants and Procedure

- Procedures utilized participants in same-gender friend dyads.
- Participants were 179 adolescents—119 female and 60 male—in 8th, 9th, and 10th grade.
- Participants had their heart rate, skin conductance, and respiration monitored via physiological sensors.
- Friends completed friendship questionnaires evaluating positive friendship quality, conflict, affective closeness, intimacy, companionship, validation, conflict resolution, helping, emotional closeness, friendship satisfaction, and co-rumination.

### Measures

- **RSA Reactivity:** The change in participants’ respiratory sinus arrhythmia from their measured 3-minute baseline to during a problem talk interaction task indexes changes in parasympathetic nervous system activity and is an indicator of stress response.
- **Friendship Adjustment:** The Friendship Quality Questionnaire (Parker & Asher, 1993) contains 18 items rated on a 5-point scale and provided scores for both positive friendship qualities and negative friendship qualities.

## RESULTS

**Table 1.**

*Gender differences in mean measurements of friendship characteristics*

	Full Sample (179)	Male (N=60)	Female (N=119)
RSA Change (SD)	0.015 (3.347)*	0.106 (3.226)	1.459 (3.331)
Positive Friendship Quality (SD)	4.254 (0.491)**	3.975 (0.538)	4.390 (0.404)
Conflict (SD)	1.557 (0.688)	1.630 (0.808)	1.521 (0.623)
Affective Closeness (SD)	3.993 (0.598)**	3.993 (0.598)	4.507 (0.396)
Intimacy (SD)	3.900 (0.830)**	3.275 (0.835)	4.206 (0.636)
Companionship (SD)	4.002 (0.789)+	3.826 (0.779)	4.089 (0.784)
Validation (SD)	4.258 (0.672)*	4.047 (0.748)	4.364 (0.606)
Conflict Resolution (SD)	4.305 (0.680)+	4.167 (0.701)	4.375 (0.660)
Helping (SD)	4.101 (0.725)*	3.872 (0.789)	4.216 (0.665)
Emotional Closeness (SD)	4.592 (0.508)**	4.383 (0.582)	4.697 (0.432)
Friendship Satisfaction (SD)	4.855 (0.376)+	4.783 (0.490)	4.891 (0.299)
Co-rumination (SD)	2.701 (0.884)*	2.419 (0.818)	2.844 (0.885)

\*  $p < 0.01$ , \* $p < 0.05$ , + $p < 0.10$

## DISCUSSION

### Significant Findings ( $p < 0.05$ )

- Female participants demonstrate significantly higher association for RSA change, positive friendship quality, validation, affective closeness, intimacy, helping, emotional closeness, and co-rumination than their male counterparts.
- For male participants, higher friendship satisfaction is associated with negative RSA change. This implies that more satisfying friendships are linked to better physiological regulation during problem talk.

### Marginally Significant Findings ( $p < 0.10$ )

- Female participants scored higher in companionship, conflict resolution, and friendship satisfaction than male participants.
- For both male and female participants, RSA change was associated with validation, implying that more validating friendships are frequently accompanied by higher physiological regulation.

## REFERENCES

Beauchaine, T. (2001). Vagal tone, development, and Gray’s motivational theory: toward an integrated model of autonomic nervous system functioning in psychopathology. *Development and Psychopathology*, 13(2), 183–214.

Carlisle, M., Uchino, B. N., Sanbonmatsu, D. M., Smith, T. W., Cribbet, M. R., Birmingham, W., Light, K. C., & Vaughn, A. A. (2012). Subliminal activation of social ties moderates cardiovascular reactivity during acute stress. *Health Psychology*, 31(2), 217–225.

Demir, M., & Urberg, K. A. (2004). Friendship and adjustment among adolescents. *Journal of Experimental Child Psychology*, 88(1), 68–82.

Murray-Close, Dianna & Nelson, David & Ostrov, Jamie & Casas, Juan & Crick, Nicki. (2016). Relational Aggression: A Developmental Psychopathology Perspective.

Porges SW. The polyvagal theory: phylogenetic substrates of a social nervous system. *Int J Psychophysiol*. 2001 Oct;42(2):123-46.

Porges S. W. (2009). The polyvagal theory: new insights into adaptive reactions of the autonomic nervous system. *Cleveland Clinic journal of medicine*, 76 Suppl 2(Suppl 2), S86–S90.

Rose, A. J., Carlson, W., & Waller, E. M. (2007). Prospective associations of co-rumination with friendship and emotional adjustment: considering the socioemotional trade-offs of co-rumination. *Developmental psychology*, 43(4), 1019–1031.

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