



Adolescents’ Emotional and Physiological Reactivity to Positive and Negative Friendship Interactions

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Introduction

- Friendship interactions have important implications for adjustment during adolescence (Furman & Rose, 2015)
 - Adolescents’ negatively-focused problem talk with friends is linked to increases in depressive symptoms (e.g., Schwartz-Mette & Rose, 2012)
 - Talking to friends about positive life events has been linked to lower depressive symptoms (Smith, 2011)
 - Less is known, however, about adolescents’ more immediate emotional responses to friendship interactions.
- Interacting with friends can also affect physiological responses.
 - For example, talking about problems has been linked to increases in physiological stress responses (Byrd-Craven, 2010)
 - Parasympathetic nervous system (PNS) activity has important implications for close relationships (Porges, 2009); however, few studies consider adolescent friendships.
- Changes in respiratory sinus arrhythmia (RSA) are a measure of PNS activity (Porges, 2001; 2009).
 - Increases in RSA reflect PNS activation (e.g., heartrate slows, rest & digest functions) and a state of calm, positive affiliation.
 - Decreases in RSA reflect PNS deactivation and a state of attention and engagement (e.g., with a challenge).
- This study aims to examine adolescents’ emotional and physiological (i.e., RSA) reactivity to positive and negative valence interactions with friends

Hypotheses

Emotional Reactivity

- Subjective report of positive affect will increase from before to after positive task
- Subjective report of negative affect will increase from before to after negative task

Physiological Reactivity

- RSA will increase during Positive Task
- RSA will decrease during Negative Task

Gender Differences

- Girls will experience greater changes in affect and physiology than boys

Method

- Participants were adolescents (46 boys, 100 girls) in the 8th, 9th, and 10th grades who participated in a research study with a same-gender close friend.
- The friends completed two interaction tasks together: a **Positive Valence Task** (plan a party) and a **Negative Valence Task** (talk about a problem)
- **Emotional reactivity:** adolescents reported on positive (e.g., happiness) and negative (e.g., upset) emotions before and after each task using the Positive and Negative Affect Scale (Watson et al., 1999).
- **Physiological reactivity:** participants wore heartrate monitors and respiratory belts and Mindware software was used to compute RSA.
 - For pre-task RSA, adolescent friend sat quietly side-by-side for 3 min.
 - RSA was measured during each task and averages were computed.

Results

Table 1
Emotional and Physiological Reactivity: Positive Task

	Pre-Task <i>M</i> (<i>SD</i>)	Post-Task <i>M</i> (<i>SD</i>)	t-value
Positive Affect	2.87 (0.85)	3.00 (0.89)	3.41**
Negative Affect	1.23 (0.31)	1.13 (0.18)	4.56**
RSA	6.18 (1.26)	5.71 (1.23)	3.74**

Table 2
Emotional and Physiological Reactivity: Negative Task

	Pre-Task <i>M</i> (<i>SD</i>)	Post-Task <i>M</i> (<i>SD</i>)	t-value
Positive Affect	2.85 (0.77)	3.04 (0.81)	6.78**
Negative Affect	1.36 (0.33)	1.21 (0.23)	3.97**
RSA	6.56 (1.12)	5.77 (1.01)	10.66**

Table 3
Gender Differences: Positive Task

	Positive Task F Value	Negative Task F Value
Positive Affect		
Gender	0.202	0.017
Reactivity	8.653*	18.262**
Gender x Reactivity	0.399	2.380
Negative Affect		
Gender	0.093	0.654
Reactivity	13.143**	34.189**
Gender x Reactivity	3.341	1.552
RSA		
Gender	0.092	0.064
Reactivity	97.91**	10.401*
Gender x Reactivity	0.764	0.003

- The repeated measures t-tests were all significant
- Positive emotion increases from before to after friendship interactions
- Negative emotion decreases from before to after friendship interactions

Discussion

Emotional Reactivity

- Positive emotions increase and negative emotion decreases from before to after friendship interactions
- Contrary to the hypothesis, the positive task (plan party) and negative task (problem talk) had no effect on reactivity
- Findings suggest that adolescents enjoy talking with their friends based on changes in their emotions (i.e., positive emotions increased, negative emotions decreased).
- However, this could vary depending on behaviors during the task and characteristics of the adolescents engaging in the task.
 - Take into consideration the behaviors for each task (Schwartz-Mette et. Al, 2018) is possible that kids who co-ruminated might experience increases in negative affect; this could be examined in future work.
 - Research finds that youth with depressive symptoms (Schwartz-Mette, Smith, 2016) have difficulties with friendship interactions. Studies have shown that the more elevated emotional symptoms an individual has, the more likely they are to talk about topics that facilitate negative affects. (Shwartz-Mette, 2018)

Physiological Reactivity

- We hypothesized that RSA would increase during the Positive Task and decrease during the Negative Task.
- Contrary to hypotheses, results indicated that RSA decreased during both tasks.
- It will be important for future research to examine behaviors in relation to changes in RSA during friendship interactions.
 - RSA decreases could especially if adolescents were especially stressed or upset when talking about problems during the negative task. For example, past work has linked dwelling on negative affect during problem talk to cortisol responses (Byrd-Craven, 2010).
- It is also important to note short-term changes in RSA because of quick fluctuation.
 - RSA is measured throughout the respiratory cycle and indexes heartrate variability; thus fluctuating frequently
 - Participants’ RSA could increase/decrease in total, but would be different in shorter term intervals

References

- Byrd-Craven, Jennifer, et al. “Stress Reactivity to Co-Rumination in Young Women’s Friendships: Cortisol, Alpha-Amylase, and Negative Affect Focus.” *Journal of Social and Personal Relationships*, vol. 28, no. 4, 2010, pp. 469–487., doi:10.1177/0265407510382319.
- Furman, W., & Rose, A. J. (2015). Friendships, romantic relationships, and other dyadic peer relationships in childhood and adolescence: A unified relational perspective. In R. Lerner, M. E. Lamb, & C. G. Coll (Eds.), *The handbook of child psychology and developmental science: Social and emotional development*(Vol. 3, 7th ed.). Hoboken: Wiley.
- Porges, S. W. (2009). The polyvagal theory: New insights into adaptive reactions of the autonomic nervous system. *Cleveland Clinical Journal of Medicine*, 76, S86–S90. <https://doi.org/10.1007/s11103-011-9767-z>.Plastid
- Schwartz-Mette, R. A. & Smith, R. L. (2016). When does co-rumination mediate depression contagion in adolescent friendships? Investigating intrapersonal and interpersonal factors. *Journal of Clinical Child and Adolescent Psychology*, 1-13.
- Schwartz-Mette, R. A., Lawrence, H. R., Shankman, J., Fearey, E., & Dueweke, A. (2018). Birds of a feather want to talk together: The impact of depressive symptoms on initial stages of friendship formation in older adolescence. *Journal of Social and Clinical Psychology*, 37, 769-793.
- Schwartz-Mette, R. A., & Rose, A. J. (2012). Co-rumination mediates contagion of internalizing symptoms within youths’ friendships. *Developmental Psychology*, 48, 1355–1365.
- Smith, T. W., Cribbet, M. R., Nealey-Moore, J. B., Uchino, B. N., Williams, P. G., Mackenzie, J., & Thayer, J. F. (2011). Matters of the variable heart: Respiratory sinus arrhythmia response to marital interaction and associations with marital quality. *Journal of Personality and Social Psychology*, 100, 103–19. <https://doi.org/10.1037/a0021136>
- Watson, David, and Lee Anna Clark. “The PANAS-X: Manual for the positive and negative affect schedule-expanded form.” (1999).

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