Supplemental Materials for Singlehood and Attunement of Self-Esteem to Friendships

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Other Variables in the Study (Not all variables were included at all Waves)

- Body image
- Academic performance
- Adverse life events (i.e., death, health problems, financial problems)
- Year at University
- Living Situation
- New friend
- Friend conflict
- Parent closeness & conflict
- Romantic partner investment
- Romantic partner closeness
- Romantic relationship quality
- Romantic partner conflict
- New relationship initiation behaviors
- Expressions of romantic interest
- Partner religion
- Multiple partners
- Partner commitment
- Desire for commitment
- Partner conflict
- Relationship end (& partner who ended it)
- Romantic rejection
- Unsuccessful relationship initiation attempts
- New job
- Dieting behavior
- Positive life events
- Attachment figure
- Satisfaction with life
- Satisfaction with academics
- Satisfaction with career
- Satisfaction with weight
- Satisfaction with appearance
- Satisfaction with sex
- Best friend quality
- Self-ratings of communal and status qualities
- Stress
- Friendship conflict
- Friendship closeness
- Friendship dependence
- Reason for breakup
- Parent ethnicity and years in Canada
- Partner weight
- Partner height
- Partner gender
- Partner ethnicity
- Self standards
- Attitudes toward attachment figure
- Parents conflict
- Parents divorced
Additional Item Information for Measures Reported in the Manuscript

**Friendship quality.** The individual items included in this measure were as follows: “I am comfortable being close to my friends”, “I wonder whether my friends really care for me” (reverse-coded), and “In general, I am satisfied with my friendships” (adapted from Cook, 2000; Fletcher et al., 2000; Fraley, Waller, & Brennan, 2000).

**Self-esteem.** This measure consisted of the following items derived from Rosenberg (1965) self-esteem scale: “I feel I am a person of worth, at least on an equal basis with others;” “I feel that I have a number of good qualities;” “I certainly feel useless at times;” and “At times, I think I am no good at all.” The latter two items were reverse coded prior to calculation of an average global self-esteem score.

**Friendship investment.** Participants answered four items adapted from Rusbult and colleagues’ (1998) Investment Model of Commitment: “I have put a great deal into my friendship that I would lose if my friendship were to end;” “Compared to other people I know, I have invested a great deal in my relationship with my friend;” “It would take me a fairly long time to find another friendship as good as my current one;” and “It would be somewhat difficult for me to find another friend who meets my needs the way my close friend does.”

Additional Items Used in Supplemental Analyses

**Family relationship quality.** At Waves 1-3 and Waves 5-8, participants used a similar scale as the friendship quality scale to indicate their comfort depending on their family, their relational doubts about their family relationships (reverse-coded), and satisfaction with their relationship with their parents. These items were averaged to form a composite measure of family relationship quality (average \( \alpha = .74 \)).
**Romantic relationship quality.** At Waves 1-3 and Waves 5-8, partnered participants indicated their comfort being close to their romantic partner, their relational doubts about their romantic relationship (reverse-coded), and satisfaction with their relationship with their partner, using three items similar to those used to measure friendship quality and family quality (Cook, 2000; Fletcher et al., 2000; Fraley et al., 2000). Four additional items, specific to romantic relationships were also included: “My partner is exactly the type of person I want as a life-long partner”, “In general, my romantic partner is able to make me feel better when I am upset”, “In general, I am able to make my romantic partner feel better when he/she has a problem or feels upset”, and “I’m confident that my partner thinks I’m a valuable person.” All items were averaged to form a composite measure of romantic relationship quality (average $\alpha = .83$).
Descriptive Statistics for Singles and Partnered People at Each Wave

The following table (Supplemental Table 1.) includes the means, standard deviations, sample sizes, and t-test results for friendship quality and self-esteem at each wave.

| Variable          | Wave | M   | SD  | n   | M   | SD  | n   | CI95%     | d   | p   |
|-------------------|------|-----|-----|-----|-----|-----|-----|-----------|-----|-----|
| Friendship Quality|      |     |     |     |     |     |     |           |     |     |
|                   | 1    | 5.49| 1.12| 152 | 5.69| 1.13| 117 | -0.47, 0.07 | 0.18 | 0.15 |
|                   | 2    | 5.57| 1.18| 126 | 5.54| 1.21| 127 | -0.27, 0.32 | 0.02 | 0.88 |
|                   | 3    | 5.36| 1.16| 118 | 5.63| 1.02| 101 | -0.56, 0.03 | 0.24 | 0.07 |
|                   | 4    | 5.44| 1.08| 85  | 5.45| 1.16| 85  | -0.35, 0.33 | 0.01 | 0.95 |
|                   | 5    | 5.30| 1.15| 68  | 5.52| 1.07| 82  | -0.57, 0.14 | 0.20 | 0.23 |
|                   | 6    | 5.57| 1.18| 59  | 5.66| 0.85| 87  | -0.42, 0.25 | 0.08 | 0.62 |
|                   | 7    | 5.60| 1.08| 70  | 5.54| 1.13| 89  | -0.29, 0.42 | 0.06 | 0.70 |
| Self-Esteem       |      |     |     |     |     |     |     |           |     |     |
|                   | 1    | 4.99| 1.20| 152 | 5.44| 1.07| 118 | -0.72, -0.17 | 0.39 | 0.002 |
|                   | 2    | 5.08| 1.31| 130 | 5.30| 1.13| 128 | -0.52, 0.07 | 0.19 | 0.14 |
|                   | 3    | 4.90| 1.25| 120 | 5.38| 0.98| 103 | -0.77, -0.17 | 0.42 | 0.002 |
|                   | 4    | 5.07| 1.25| 86  | 5.40| 1.14| 85  | -0.69, 0.03 | 0.28 | 0.07 |
|                   | 5    | 4.94| 1.20| 68  | 5.54| 1.17| 82  | -0.99, -0.22 | 0.51 | 0.002 |
|                   | 6    | 5.06| 1.31| 58  | 5.38| 1.12| 86  | -0.72, 0.08 | 0.27 | 0.12 |
|                   | 7    | 4.99| 1.29| 70  | 5.52| 1.12| 88  | -0.91, -0.15 | 0.44 | 0.006 |

Additional Analyses

Using independent samples t-tests, we compared the reliabilities and ranges of self-esteem and friendship quality for single and partnered people across the seven waves for which we had data (Waves 1-3 and Waves 5-8). There were no significant differences in the reliabilities of self-esteem for single and partnered people, $t(9.49) = 1.81, p = 0.10$, or the reliabilities of friendship quality for single and partnered people, $t(10.7) = -1.23, p = 0.24$. The same was true for the ranges of self-esteem, $t(11.97) = 0.94, p = 0.37$, and friendship quality, $t(11.07) = 0.13, p = 0.90$, for single and partnered people.
Testing Exploratory Questions and Alternative Models

Does relationship status predict attunement to family relationships?

In brief. For comparison purposes, we explored whether relationship status moderates attunement to family relationship quality. We also explored the trajectory of family relationship quality for both single and partnered people. Results suggest that self-esteem is not attuned to family relationships.

For comparison purposes, we substituted between and within-person family relationship quality for friendship quality in the original model (see Table 2 in main document). This time, a main effect of relationship status revealed that partnered participants had higher self-esteem than single participants ($R^2 = 0.005; 0.5\%$ variance explained). A main effect of between-person family relationship quality (i.e., PM family quality) revealed that participants with family quality that was above the sample average also had self-esteem that was above the sample average ($R^2 = 0.12; 12\%$ variance explained). However, within-person changes in family quality (i.e., PMC family quality) did not predict within-person changes in self-esteem, nor did relationship status interact with either indicator of family quality. These results suggest that among this sample of emerging adults, self-esteem was not attuned to family relationship quality (see Supplemental Table 2).

| Supplemental Table 2. Self-esteem as a function of between- and within-person family relationship quality and relationship status |
|---------------------------------------------------------------|
| **Dependent Variable: Self-esteem (All Participants)**          |
| Fixed Effects | $b$ | $SE_b$ | $t$ | $df$ | 95\% CI |
|----------------|-----|--------|-----|------|---------|
| Intercept      | 2.09*** | 0.41  | 5.12 | 859  | 1.29, 2.89 |
| Time in Study  | 0.09*  | 0.04  | 2.30 | 859  | 0.01, 0.16 |
| Gender         | 0.23  | 0.14  | 1.57 | 274  | -0.05, 0.51 |
### Supplemental Table 3. Family relationship quality (top), and romantic relationship quality (bottom) over time as a function of relationship status

| Fixed Effects               | b   | SE<sub>b</sub> | t    | df  | 95% CI       |
|-----------------------------|-----|---------------|------|-----|--------------|
| Intercept                   | 5.87*** | 0.07         | 85.15 | 875 | 5.72, 6.02   |
| Gender                      | -0.12 | 0.14          | -0.86 | 275 | -0.41, 0.16  |
| Time in Study               | 0.11*  | 0.06          | 1.98  | 875 | 0.001, 0.23  |
| Relationship Status         | 0.05  | 0.07          | 0.70  | 875 | -0.09, 0.19  |

*Note. PM = Person Mean, PMC = Person-Mean Centered, ***p < .001, *p < .05.

In addition, family quality increased over time for everyone (R^2 = 0.01; 1% variance explained), regardless of their relationship status and, for partnered participants, romantic relationship quality did not change over time (see Supplemental Table 3). Together, these findings suggest that relationship status predicts the trajectory of young adults’ friendship bonds, but not their family bonds.
| Time in Study | Relationship Status | Dependent variable: Romantic Relationship Quality (Partnered Participants) |
|--------------|---------------------|----------------------------------------------------------------------------|
|              | 0.03 0.07 0.40 875 -0.12, 0.18 |

| Fixed Effects  | b   | SE<sub>b</sub> | t    | df | 95% CI   |
|----------------|-----|---------------|------|----|----------|
| Intercept      | 6.04*** | 0.06         | 96.99 | 398 | 5.24, 5.53 |
| Gender         | -0.24 | 0.14         | -1.69 | 398 | -0.52, 0.04 |
| Time in Study  | -0.03 | 0.05         | -0.79 | 398 | -0.57, 0.57 |

Note. ***p < .001. **p <.01. *p <.05.

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**Can We Flip Friendship Quality and Friendship Investment in our Model?**

**In brief:** No. Friendship quality did not predict changes in friendship investment or subsequent self-esteem when we tested whether friendship quality and friendship investment could be swapped in our original model.

In this test, we had to use an earlier measure of relationship status (Wave 3) to predict friendship quality at Wave 4, and subsequent friendship investment at Wave 5 because not every measure was included at every wave. However, in this flipped model, relationship status did not directly predict friendship quality, \( b = -0.37, B = -0.16, SE = 0.26, t(75) = -1.40, p = .17 \), nor was there an indirect effect of relationship status on friendship investment via friendship quality, \( b = -0.12, 95\% CI [-0.35, 0.04], p = .18 \). There was also no direct pathway from Wave 5 friendship investment to Wave 6 self-esteem, \( b = -0.03, B = -0.06, SE = 0.05, t(72) = -1.07, p = .29 \). These results lend support to our proposed model over this alternative model.

**Does Friendship Investment Predict Changes in Friendship Quality and Self-Esteem?**

**In brief:** No. There was no indirect path from relationship status to change in self-esteem through friendship investment and change in friendship quality.
We tested the same model as in the main manuscript, this time however, we examined how relationship status and friendship investment predict change in friendship quality and subsequent self-esteem (Relationship Status [Wave 5] → Friendship Investment [Wave 5] → \( \Delta \)Friendship Quality [Wave 6] → \( \Delta \)Self-Esteem [Wave 6]). To assess change in friendship quality and self-esteem, we controlled for friendship quality at Wave 4 (there was no such measure in wave 5) and self-esteem at Wave 5 in the respective models.

First we entered gender (control variable), friendship quality at Wave 4 (control variable), and relationship status at Wave 5 into a regression predicting friendship investment at Wave 5, and relationship status still predicted investment, \( b = -.82, B = -.26, SE = .34, t(75) = -2.44, p = .02 \). We then added friendship investment at Wave 5 into the same regression predicting friendship quality at Wave 6, but friendship investment at Wave 5 did not predict friendship quality at Wave 6 when Wave 4 friendship quality was controlled, \( b = .08, B = .12, SE = .06, t(75) = 1.38, p = .17 \). In other words, investment did not predict change in friendship quality between Waves 4 and 6. Furthermore, there was no indirect path from relationship status to change in friendship quality via investment, \( b = -.07, 95\% CI [-.20, .03] \). When we added self-esteem at Wave 5 and friendship quality at Wave 6 to the same regression predicting self-esteem at Wave 6, Friendship quality at Wave 6 did predict self-esteem at Wave 6, \( b = .53, B = .24, SE = .10, t(72) = 5.18, p < .001 \). This suggests that change in friendship quality between Waves 4 and 6 predicted change in self-esteem between waves 5 and 6 (this is just the attunement effect we reported in the main manuscript, but wearing a different hat). However, there was no indirect effect from relationship status to change in self-esteem via friendship investment and change in friendship quality, \( b = -.03, SE = .03, 95\% CI [-.11, .02] \), most likely due to the lack of association between investment and change in friendship quality. As it turns out, there was a high degree of stability in friendship quality.
quality over time \((r = 0.73)\), thus controlling for Wave 4 friendship quality left little variance in Wave 6 friendship quality to explain in our analyses, making it difficult to predict change in friendship quality and self-esteem.

**Are Partnered People More Attuned to Romantic Bonds than Friendship Bonds?**

**In brief:** No. In our sample, people in relationships are not more attuned to their romantic relationships than their friendships.

We explored whether people are more psychologically attuned to their romantic relationships than their friendships when they are partnered. To evaluate this possibility, we added between- and within-person romantic relationship quality in the original model predicting partnered participants’ self-esteem. Because we are collapsing across all timepoints, participants without romantic relationship quality data were dropped during analysis. The results are presented in Supplemental Table 4. Within-person changes in romantic relationship quality (i.e., PMC relationship quality) and within-person changes in friendship quality (i.e., PMC friendship quality) each independently predicted self-esteem, suggesting that when people are in romantic relationships, their self-esteem is attuned to both their romantic bond and their friendships. To test whether partnered participants’ self-esteem was more strongly attuned to their romantic relationships than their friendships, we compared this model to a new model where person-mean centered friendship quality and person-mean centered romantic relationship quality were summed and included as a new predictor (see Judd & McClelland, 1998). Comparing the logLik of these two models suggests that psychological attunement to friendships and psychological attunement to romantic relationships do not significantly differ, \(X^2(1) = 1.47, p = .23\). Therefore it is not necessarily the case that partnered people are more psychologically attuned to their
romantic relationships than their friendships. However, it is possible that this pattern of attunement may change over the life course.

Supplemental Table 4. Self-esteem as a function of between- and within- person friendship quality and romantic relationship quality for partnered people

| Fixed Effects                      | Dependent Variable: Self-esteem |
|-----------------------------------|---------------------------------|
|                                   | $b$  | $SE_{b}$ | $t$  | $df$  | 95% CI     |
| Intercept                         | 1.34* | 0.61    | 2.20 | 394   | 0.15, 2.52 |
| Time in Study                     | 0.14** | 0.05   | 2.79 | 394   | 0.04, 0.24 |
| Gender                            | 0.38*  | 0.19    | 2.06 | 171   | 0.02, 0.75 |
| PM Friendship Quality             | 0.51*** | 0.07  | 7.00 | 171   | 0.36, 0.65 |
| PMC Friendship Quality            | 0.14** | 0.04    | 3.33 | 394   | 0.06, 0.23 |
| PM Romantic Relationship Quality  | 0.18   | 0.10    | 1.78 | 171   | -0.02, 0.38 |
| PMC Romantic Relationship Quality | 0.23*** | 0.06  | 4.13 | 394   | 0.12, 0.34 |

*Note. PM = Person Mean, PMC = Person Mean Centered*

**Does Romantic Partner Investment Negatively Predict Friendship Investment?**

**In brief:** No. Romantic partner investment did not predict friendship investment.

Qualitative data suggests that people might perceive their important relationships in a limited, zero-sum manner (Cronin, 2015). In other words, they may perceive that time invested in their friendships is time taken away from their romantic partner, and vice versa. If this is indeed the case, we would expect that psychological investment in a romantic partner would be inversely related to psychological investment in friendships. We tested a model investigating whether investment in a romantic partner negatively predicted investment in friendships among
partnered people. Interestingly, romantic partner investment at Wave 5 was not a significant predictor of friendship investment at Wave 5, $b = .01, B = .009, SE = .16, t(78) = 0.08, p = .94$. Therefore, it is not necessarily the case that partnered people view their relationships in a zero-sum way. Instead, both types of relationships appear to be distinct and have their own implications for well-being.

**Do Increases in Romantic Quality Predict Decreases in Friendship Quality Independent of Time?**

In brief: No. Romantic relationship quality and friendship quality are positively associated. At times when romantic relationship quality increases, friendship quality also increases.

By the same zero-sum logic, we might expect that as romantic relationship quality increases (a signal of greater investment in this relationship), friendship quality may decrease. To test this, we entered time in study (measured in years) and romantic relationship quality into a model predicting friendship quality. We included both the average romantic relationship quality for each partnered participant over the course of the study (i.e., person mean [PM] romantic relationship quality) as well as each participant’s deviation around their own mean level of romantic relationship quality (i.e., person-mean centered [PMC] romantic relationship quality) as predictors.

Both between- and within-person romantic relationship quality were positively associated with friendship quality. In other words, partnered participants with above average romantic relationship quality also tended to have above average friendship quality, $b = .39, SE = .10, t(172) = 3.82, p < .001$. Within-person increases in romantic relationship quality also predicted within-person increases in friendship quality, $b = .18, SE = .06, t(78) = 2.76, p < .001$. 
