

Study Information

Title: Does Grateful Love Take Two? New insights into Associations Between Partner Match on Gratitude and Relationship Satisfaction Using Six Longitudinal Datasets

Authors: Yoobin Park, Amie M. Gordon, Sarah Humberg, Amy Muise, Emily A. Impett

Research Descriptions

The main aim of this project is to replicate and extend the findings from McNulty and Dugas (2019) using six different longitudinal samples with participants of varying relationship lengths. This project will proceed in two preregistered steps. Part 1 of the project focused on replicating the previous effects by taking the same analytic approach as in McNulty and Dugas (2019) and has been completed (see <https://osf.io/g4jxt/> for the preregistration of Part 1). This preregistration is Part 2 which involves using Response Surface Analysis (RSA; Edwards & Parry, 1993) to extend the findings from Part 1. Below we list the main research questions we are testing.

Research Question 1. Are people more satisfied with their relationship when they and their partner are similar in their levels of gratitude towards each other as compared to when they have more discrepant levels of gratitude? This question seeks to extend the results from the Part 1 that a person's own level of gratitude was differentially associated with satisfaction depending on their partner's level of gratitude.

Statistical test of research question 1: We will conduct dyadic response surface analyses (DRSA; Schönbrodt, Humberg, & Nestler, 2018) to test how (dis)similarity in the two partners' levels of gratitude is related to the partners' relationship satisfaction. All analyses will be run in R using the lavaan package and syntax has been uploaded on OSF. All our analyses will be based on subsets of raw data pooled from the six independent samples (i.e., Integrative data analysis; Curran & Hussong, 2009). Separate models will be run for satisfaction assessed using different scales. See the Analysis section for more details.

Research Question 2. Do people change (e.g., increase) in satisfaction differently over time when they and their partner are similar in their levels of gratitude towards each other at baseline compared to when they have more discrepant levels of gratitude?

Statistical test of research question 2. We will run a similar DRSA model as for research question 1 to test the joint effects of own and partner gratitude on one's future satisfaction, controlling for the individual's baseline satisfaction.

Research Question 3. Are people more committed to their relationship when they and their partner are similar in their levels of gratitude towards each other at baseline?

Research Question 4. Do people change (e.g., increase) in commitment differently over time when they and their partner are similar in their levels of gratitude towards each other at baseline?

Statistical test of research questions 3-4. We will run the same DRSA models as for research questions 1 and 2 with satisfaction replaced with commitment.

Research Question 5. Do people report higher levels of gratitude at the follow-up when the they and their partner are similar in their levels of gratitude towards each other at baseline?

Statistical test of research question 5. We will run a DRSA model to test the joint effects of own and partner gratitude on one's future gratitude.

Current study: Analyses

As preliminary analyses, we will examine the frequency of discrepant predictor combinations for both directions of incongruence. Specifically, following Humberg, Schönbrodt, Back, and Nestler (in press; see also Fleenor, McCauley, & Brutus, 1996), we will categorize a couple's predictor combination as incongruent when one person's gratitude exceeds the respective partner's gratitude by at least half a standard deviation (*SD*) of all participants' gratitude values. The combination will be considered as being roughly congruent (i.e., the two partners of a couple are similarly grateful) when the partners' gratitude values are within half a *SD* from one another. In case one of the categories is only sparsely populated with data points, we will interpret the results of RSA in the light of this finding (see also Humberg et al., in press).

Statistical models: Our analyses will be based on different subsets of data from the six datasets. For research questions #1 – 4, given the differences in the scales used to assess our outcome variables (see Table 1 on page 10), we will run two models for satisfaction (one model using two datasets that used PRQC, the other model using three datasets that used CSI), and two models for commitment (one model using two datasets that used PRQC, the other model using three datasets that used IMS). Five models will be used for satisfaction and commitment as one dataset did not use PRQC or CSI to assess satisfaction and one dataset did not assess commitment at all. Research question #5, which predicts actor's follow-up gratitude, will be based on all six datasets.

As the models for all our research questions take the same form with only the outcome of interest changing, we describe details of two of our models (corresponding to research question 1 and 2) below.

Statistical test of research question 1: We will estimate path models with polynomial regressions which regress satisfaction on both partners' gratitude, the two squared terms, and the interaction term between the two partners' gratitude. We will include dummy variables encoding study membership as covariates. That is, we will estimate the following SEM:

$$\begin{aligned} Z_1 &= b_{01} + b_{11}X_1 + b_{21}X_2 + b_{31}X_1^2 + b_{41}X_1X_2 + b_{51}X_2^2 + b_{61}S_1 + \dots + b_{(5+k)1}S_{k-1} + e_1 \\ Z_2 &= b_{02} + b_{12}X_2 + b_{22}X_1 + b_{32}X_2^2 + b_{42}X_1X_2 + b_{52}X_1^2 + b_{62}S_1 + \dots + b_{(5+k)2}S_{k-1} + e_2 \\ e_1 &\sim e_2 \end{aligned}$$

Here, Z_1 and Z_2 denote the outcome values of two partners in the couple at the baseline assessment. Because our data consist of indistinguishable dyads, we will randomly decide for each couple whose outcome data will be used in the first equation ("Partner 1") and whose will be used in the second equation ("Partner 2"). The variable X_1 denotes the level of gratitude of Partner 1 at the baseline assessment, X_2 denotes the level of gratitude of Partner 2 at the baseline assessment. We will apply several constraints to the model so that the two equations of the two (indistinguishable) dyad members will be estimated to

have equal (linear and squared) actor effects ($b_{11}=b_{12}$, $b_{31}=b_{32}$), equal (linear and squared) partner effects ($b_{21}=b_{22}$, $b_{51}=b_{52}$), equal coefficients of the interaction term ($b_{41}=b_{42}$), equal intercepts ($b_{01}=b_{02}$), and equal residual variances ($\text{var}(e_1)=\text{var}(e_2)$). The coefficients of the study membership (dummy-coded for a number of k studies) will also be estimated as equal (e.g., $b_{61}=b_{62}$).

Statistical test of research question 2: We will run a similar polynomial SEM as for question 1 that regresses follow-up satisfaction on both partners' gratitude, the two squared terms, and the interaction term. Baseline satisfaction and the dummy variables encoding study membership will be included as covariates and their coefficients will be estimated as equal across the partners.

Details about the implementation: Consistent with the fixed effects IDA approach (Curran & Hussong, 2009), we include dummy variables that encode study membership as predictors in all our fitted models. In estimating RSA models for the indistinguishable partners, we follow Schönbrodt and colleagues' (2018) approach of using structural equation modeling (SEM). Standard errors will be bootstrapped with 10,000 replications and we will estimate all parameters based on all available data (i.e., we will treat missing data with full-information maximum likelihood estimation, "FIML" in lavaan). All analyses will be conducted using the *lavaan* (Rosseel, 2012) package in R. The syntax will be uploaded together with this pre-registration.

Inference criteria: In accordance with the general strategy of RSA (Edwards, 2002; Humberg, Nestler, & Back, 2019), we will compute auxiliary RSA parameters from the estimated regression coefficients as follows:

$$\begin{aligned} a_1 &= b_1 + b_2 \\ a_2 &= b_3 + b_4 + b_5 \\ a_3 &= b_1 - b_2 \\ a_4 &= b_3 - b_4 + b_5 \\ a_5 &= b_3 - b_5 \end{aligned}$$

As the most important principle in our interpretation of the effects, all parameters will be interpreted in conjunction with one another rather than in isolation (Humberg et al., 2019). Based on Schönbrodt et al. (2018; see also Humberg et al., 2019), support for the similarity hypothesis (i.e., similar levels of the two partners' gratitude are associated with better relationship satisfaction) can be inferred if 1) a_4 is significantly negative (surface above the line of incongruence [LOIC] is an inverted U-shape), 2) a_3 does not significantly differ from 0 (the highest point of LOIC is above the LOC), and 3) a_5 does not significantly differ from 0 (the first principal axis does not significantly differ from the LOC).

In the case in which these four conditions are satisfied, a congruence effect in a broad sense is supported (i.e., when comparing two couples with the same within-couple average of gratitude, the more similar couple has the higher outcome value). In such a case, we will investigate whether the similarity effect is qualified by an additional main effect of the average predictor level by inspecting the shape of the surface above the LOC. Specifically, we will

examine if 1) a_2 significantly differs from 0 (the surface is curved above the line of congruence [LOC]), and 2) a_1 significantly differs from 0 (the surface above the LOC rises or falls above the origin (0,0) with an increasing average predictor level; for more details, please see <https://osf.io/dxcwz/>). In the case that a_2 and a_1 are not significant, this would suggest support for a similarity effect in a strict sense (i.e., when comparing two arbitrary couples, the more similar couple has the higher outcomes value, irrespective of whether the couples differ in their average levels of gratitude).

In the case that we find that the similarity hypothesis is not supported, we will explore the patterns that are instead present in the data. To this aim, we will interpret the estimated DRSA model using methods of response surface methodology (e.g., Edwards, 2002).

Sensitivity analyses:

1) We will run the same analyses controlling for gender, age, and relationship length. Given that we had limited data for non-binary gender categories, gender will be dummy-coded to indicate 0 = men and 1 = women.

2) We will identify influential cases (i.e., single data points whose inclusion vs. exclusion heavily affect the coefficients in the DRSA model) according to three criteria that have been suggested for RSA (Edwards, 2002). That is, the data points will be considered influential when they satisfy all of the following three criteria:

- (a) $|dfFit| > 3\sqrt{k/(n-k)}$
- (b) $D > 50\text{th percentile of } F(k, n-k)$, and
- (c) $\hat{h} > 3k/n$

Difference in fit (dfFit) and Cook's distance (D) are global indicators of influence which measure the effect of deleting a given observation, and the hat value is a measure of leverage. k denotes the number of estimated parameters in the model and n indicates the sample size. If we detect any such influential cases, we will examine if excluding these cases changes the conclusions drawn from the DRSA results, to ensure the robustness of our findings.

Data description

Name or brief description of data set(s): We will use six existing datasets, five of which have been described in detail on Love Consortium Dataverse.

- 1) Self-Expansion Study; <https://doi.org/10.15139/S3/FVXARB>,
- 2) Sex and Touch study; <https://doi.org/10.15139/S3/TAI2FI>,
- 3) Sexual Decision Making Study; <https://doi.org/10.15139/S3/LTFCTH>,
- 4) Toronto Couples Study; <https://doi.org/10.15139/S3/K03YHD>,
- 5) SIR Lab Interaction Study; <https://doi.org/10.15139/S3/H3XGFB>,
- 6) Sleep and Relationships Study

Is this data open or publicly available? No, but five of the datasets have been uploaded in Love Consortium Dataverse and can be accessed by contacting the authors of each dataset.

How can the data be accessed? Provide link if available online: Five of the datasets can be accessed by requesting access from the authors of the datasets through the Love Consortium Dataverse. The sixth dataset was recently collected by one of the co-authors (Amie M. Gordon).

Date of download or access: As noted in the preregistration document of the Part 1 of this project, none of the authors had access to the full dataset until after Part 1 was preregistered.

Data Source: Own lab collection – data were collected independently in three different labs (Amie Gordon, Amy Muise, and Emily Impett's labs)

Codebook: There is no publicly accessible codebook for the datasets.

Sampling and data collection procedures:

In all studies described below, we only used the relevant data collected at background and the follow-up. No data from other parts of the study that participants completed (i.e., diary or in-lab conversations) were analyzed in any of the datasets.

- 1) Self-Expansion Study – A total of 118 mixed-sex couples were recruited through advertisements on the website Craigslist in 12 major U.S. cities. Interested participants emailed the researchers and if they met the inclusion criteria—in a relationship, living together, both partners interested in participating and aged 18 or older—they were sent the link and information for completing the background and daily surveys online. Participants ranged in age from 19 to 74 ($M = 31.5$, $SD = 10.4$) and had been in their current relationship from 4 months to 30 years ($M = 4.9$ years, $SD = 5.3$ years). All the couples were living together; 37% were married and 19% were engaged. About a third of the couples had children (31%), and of these, couples had two children on average ($M = 2.2$, $SD = 1.1$). Participants comprised a diverse range of ethnic backgrounds; 55% were White/European, 14% were African American, 8% were Asian, 5% were Latino,

3% were Native American, 1% were Indian, and 14% self-identified as “other.” Once couples agreed to participate, each partner was e-mailed a unique link. On the first day of the study, each partner completed a 30-minute background survey and then for the next 21 consecutive days, they completed a brief survey (5-10 minutes) each night before bed. The day after completing the final daily survey, participants completed a 10-minute follow-up survey. Participants completed a second follow-up approximately three months later. Participants were instructed to begin the study on the same day as their partner and not to discuss their responses with one another. Each partner was paid up to US\$50 for participating; payment was pro-rated depending on the number of daily surveys completed.

- 2) Sex and Touch Study – Ninety-eight couples were recruited from Canada via online ads (posted on Kijiji). Couples were eligible to participate if they were together in a relationship for at least 2 years, were living together and each partner was at least 18 years old (couples were pre-screened for eligibility via email and telephone). Participants’ age ranged from 21 to 61 ($M = 33$ years, $SD = 8$ years) and had been in the relationship between 2 to 25 years ($M = 8$ years, $SD = 5$ years). Couple members each completed a background survey. Then, each couple member started the 28-day diary study on the same day. Each couple member had to complete 28 daily diaries each evening in total. On average, participants completed 24.7 out of 28 days. Follow-up survey was conducted 3-months later.
- 3) Sexual Decision Making Study - Participants were recruited through online postings and classroom visits at a small Canadian university and through online postings on the websites Kijiji and Craigslist in the Greater Toronto Area. To be eligible to participate, both members of the couple had to agree to take part in the study and be over the age of 18. Eligible couples also had to see their partner several times a week and be sexually active. Interested participants who met the eligibility criteria emailed the researchers for more information about the study. After couples agreed to participate, each partner was e-mailed a unique link allowing them to access the online surveys. A total of 101 couples (95 mixed-sex, 6 same-sex) ranging in age from 18 to 53 years ($M = 26$ years, $SD = 7$ years) participated in the study. Nearly half the participants were cohabiting (29%), married (17%), or engaged (3%); the remaining participants were in a committed relationship, but not living together. Participants reported being involved their current relationship between 6 months and 22 years ($M = 4.45$ years, $SD = 3.76$ years) and identified as a diverse variety of ethnic backgrounds; 67% were White, 8% were Asian, 7% were Black, 4% were South Asian, 4% were Latin American, 4% were South East Asian, 1% were Arab/West Asian, and 5% identified as multiethnic or “other.” On the first day of the study, participants completed a 30-min background survey. Then, each day for 21 consecutive days, participants completed a 5- to 10-min daily survey. Each participant was paid up to \$40 CAD (in gift cards) for completing the background and daily surveys. Participants also completed a 3 month follow-up survey.

- 4) **Toronto Couples Study** - This dataset was collected at the University of Toronto between 2015-2017. Romantic couples from the community participated in a four-part study. To be eligible, couples were required to be in a relationship for at least 3 years. A total of 111 couples completed the study. The four parts of the study included (1) completing a background questionnaire; (2) participating in a lab session in which they were connected to physiological equipment and held three conversations, alternating as speakers and listeners, on the topics of (a) a time when they felt distressed, (b) something they would like their partner to change and (c) something about their partner they feel grateful for; and completed questionnaires about these conversations; (3) completing a 14-day daily experience ("diary") study; and (4) completing a follow-up questionnaire the day after the diary. In addition, a subset of these participants was rated by their work supervisors.

- 5) **SIR Lab Interaction Study** – Collected between 2010 and 2012, seventy-two couples from the San Francisco Bay Area (20% community participants and 80% UC Berkeley students) participated in a laboratory study with (a) baseline survey measures, (2) lab interactions, and (3) a 6-month longitudinal follow-up survey (74 participants from 53 couples completed the follow up questionnaires). To be eligible, they must have been at least 18 years old, fluent in English, and in their relationship for at least 2 months. On average, participants were 22 years old (range 18-56), had been involved in their romantic relationship for an average length of 21 months (range 1-87), 43% were Asian/Asian American or Pacific Islander, 36% were European or European American, and 9% were Hispanic (13% other race/ethnicities). 71 out of the 72 couples were heterosexual. Participants independently completed an online questionnaire in the days prior to their lab session. The couple attended the lab session together. There, the participants participated in a series of structured video-recorded conversations, and privately answered brief questionnaires at the beginning of the lab session and again after each conversation. Six months after the completion of the lab study, both partners separately completed a longitudinal follow-up survey with questions about their relationships.

- 6) **Sleep and Relationships Study**; Collected between 2016 and 2018, eighty cohabitating couples (64 heterosexual, 16 homosexual or other) from the San Francisco Bay Area participated in a daily experience study with a 6 month follow up (109 Ps from 67 couples completed the follow up, 4 couples broke up). Participants were eligible if they were between the ages of 20 and 70 ($M_{age} = 31.62$, Range = 23 - 62), had been in their relationship for at least 1 year ($M_{length} = 5.26$, Range = 1 year to 36 years) and were fluent in English. They were also required to meet a number of health-related eligibility criteria (e.g., not having a sleep disorder). One couple was excluded from data analysis due to lack of compliance with study procedures. Of the remaining 79 couples, 38.7% were married and 8.4% were engaged. The ethnic breakdown was: 14.7% Asian, 64.9% European/European American, 9.9% Hispanic, 3.7% African/African American, and 6.8% Other Ethnicity. Participants ranged in their household income (18.4% < 35K, 22% 35K-75K, 19.4% 75K-100K, 30.9% 100K-200K, 9.5% > 200K) and education (2.6% high

school diploma, 11.5% some college, 50.3% college degree, 11% some graduate work, 24.1% graduate degree).

Table 1

Sample and Study Characteristics

| | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 | Sample 6 |
|--|---------------------|----------------------|---------------------------|--------------------------|--------------------------|--------------------------|
| | (<i>n</i> = 236) | (<i>n</i> = 196) | (<i>n</i> = 188) | (<i>n</i> = 208) | (<i>n</i> = 142) | (<i>n</i> = 158) |
| Data collection | 2012 | 2016 | 2013 | 2015 – 2017 | 2010 – 2012 | 2016 – 2018 |
| Gender | 117M, 119W | 91M, 96W, 1O | 96M, 100W | 101M, 104W, 3O | M71, W73 | 76M, 81W, 1O |
| Age <i>M</i> (<i>SD</i>) | 31.6 (10.30) | 33.1 (7.80) | 26.0 (7.07) | 26.8 (7.09) | 21.8 (5.40) | 31.6 (8.08) |
| Non-heterosexual couples | 4 couples | 4 couples | 8 couples | 5 couples | 1 couple | 5 couples |
| Relationship length <i>M</i> (<i>SD</i>) | 5 yr (5 yr 4 mo) | 7 yr 10 mo (5 yr) | 4 yr 7 mo (3 yr 11 mo) | 4 yr 5 mo (3 yr 4 mo) | 1 yr 9 mo (1 yr 9 mo) | 5 yr 3 mo (5 yr 1 mo) |
| Satisfaction | PRQC (7-point) | PRQC (7-point) | IMS (7-point) | CSI (6-point) | CSI (6-point) | CSI (6-point) |
| Commitment | PRQC (7-point) | PRQC (7-point) | IMS (7-point) | — | IMS (9-point) | IMS (9-point) |
| Follow-up length | 3 months | 3 months | 3 months | 2 weeks | 6 months | 6 months |
| Retention rate | 72% | 91% | 81% | 99% | 51% | 63% |

Note. M = Men, W = Women, O = Other/unidentified. CSI = Couples Satisfaction Index; IMS = Investment Model Scale; PRQC = Perceived Relationship Quality Components Inventory.

Knowledge of data

Prior work based on the dataset: Following papers used at least one of the key variables that will be used in the current project:

1. Self-Expansion Study

- Brady, A., Baker, L. R., Muise, A. & Impett, E. A. (2020). Gratitude increases the motivation to fulfill a partner's sexual needs. *Social Psychological and Personality Science*. Advanced online publication.
- Muise, A., Harasymchuk, C., Day, L. C., Bacev-Giles, C., Gere, J., & Impett, E. A. (2019). Broadening your horizons: Self-expanding activities promote desire and satisfaction in established romantic relationships. *Journal of Personality and Social Psychology*, 116, 237-258.
- Muise, A., & Impett, E. A. (2015). Good, giving, and game: The relationship benefits of communal sexual motivation. *Social Psychological and Personality Science*, 6, 164-172.

2. Sex and Touch Study

- Debrot, A., Stellar, J., MacDonald, G., Keltner, D., & Impett, E. A. (2020). Touch and attachment in romantic relationships: Do avoidantly attached individuals benefit less from touch? *Personality and Social Psychology Bulletin*. Advance online publication.
- Jakubiak, B., Debrot, A., Kim, J. J., & Impett, E. A. (2020). Approach and avoidance motives for touch are predicted by attachment and predict daily relationship well-being. *Journal of Social and Personal Relationships*. Advance online publication.
- Kim, J. J., Muise, A., & Impett, E. A. (2018). The relationship implications of rejecting a partner for sex kindly versus having sex reluctantly. *Journal of Social and Personal Relationships*, 35, 485–508.
- Kim, J. J., Muise, A., Sakaluk, J. K., Rosen, N. O., & Impett, E. A. (2020) When tonight is not the night: Sexual rejection behaviors and satisfaction in romantic relationships. *Personality and Social Psychology Bulletin*. Advance online publication.
- Muise, A., Kim, J. J., Debrot, A., Impett, E. A., & MacDonald, G. (2020). Sexual nostalgia as a response to unmet sexual and relational needs: The role of attachment avoidance. *Personality and Social Psychology Bulletin*, 46, 1538-1552.

3 Sexual Decision Making Study

- Day, L. C., Muise, A., Joel, S., & Impett, E. A. (2015). To do it or not to do it? How communally motivated people navigate sexual interdependence dilemmas. *Personality and Social Psychology Bulletin*, 41, 791-804.
- Muise, A., Giang, E., & Impett, E. A. (2014). Post sex affectionate exchanges promote sexual and relationship satisfaction. *Archives of Sexual Behavior*, 43, 1391-1402.
- Muise, A., Stanton, S. C., Kim, J. J., & Impett, E. A. (2016). Not in the mood? Men under-(not over-) perceive their partner's sexual desire in established intimate relationships. *Journal of Personality and Social Psychology*, 110, 725-742.

4. SIR Lab Interaction Study

- Gordon, A. M., Tuskeviciute, R., & Chen, S. (2013). A multi-method investigation of depressive symptoms, perceived understanding, and relationship quality. *Personal Relationships*, 20, 635-654.

Prior Research Activity: The team has now completed Part 1 of the project which involved using the same variables as in the analyses proposed in this preregistration.

Prior Knowledge current dataset: The team has examined the current research questions using a different approach and this preregistration seeks to extend the previous analyses.

Moment of preregistration: Registration occurred prior to any researcher on the team running the proposed analyses in this preregistration.

Current study: Variables

Manipulated variables: Not Applicable

Measured variables:

We created commensurate measures for each of the variables following the moderated nonlinear factor analysis (MNLFA) scoring approach (Bauer, 2017) in Part 1 of this project. We used an R package, aMNLFA (Gottfredson et al., 2020) to build a scoring model that accounts for effects of differential item functioning (DIF) and mean and variance impact. We will use the final factor score estimates of each construct for the present DRSA analyses as well.

Key variables:

Gratitude was measured using Appreciation in Relationships scale (AIR; Gordon, Impett, Kogan, Oveis, & Keltner, 2012) which includes two subscales (“Appreciative” and “Appreciated”) and has 16 items rated on a 7-point scale.

Satisfaction was measured using three items from the Perceived Relationship Quality Components Inventory (PRQC; Fletcher, Simpson, & Thomas, 2000) in two datasets, and the 4-item Couples Satisfaction Index (CSI; Funk & Rogge, 2007) in three datasets. Items were assessed using 7-point scales in the PRQC and 6-point scales in the CSI. Note that only five datasets are used for analyses with satisfaction as an outcome (excluding the dataset that assessed satisfaction with the Investment Model Scale as there was only one such, providing an insufficient number of dyads).

Commitment was measured using seven items from the IMS in three of the datasets and using three items from the PRQC in two. Two of the datasets with IMS used 7-point scales and the other two used 9-point scales. The scores using 9-point scales were made comparable to the 7-point scale by collapsing across scores 1 and 2 (turning any 2s into 1s) as well as scores 6 and 7 (turning 7s into 6s) for each item and then recoding all of the scores to be on a scale from 1-7 (see the Supplemental Materials of the manuscript for histograms). Both datasets with PRQC used 7-point scales.

Demographic variables: gender, age, and relationship length (in years)

Scales:

- **Gratitude.** We will use 9 items of the “Appreciative” subscale of the AIR scale (Gordon et al., 2012) for the MNLFA model:
 1. I tell my partner often that s/he is the best.
 2. I often tell my partner how much I appreciate her/him.
 3. at times I take my partner for granted.
 4. I appreciate my partner.

5. sometimes I don't really acknowledge or treat my partner like s/he is someone special.
 6. I make sure my partner feels appreciated.
 7. my partner sometimes says that I fail to notice the nice things that s/he does for me.
 8. I acknowledge the things that my partner does for me, even the really small things.
 9. I am sometimes struck with a sense of awe and wonder when I think about my partner being in my life.
- **Satisfaction.** Satisfaction was assessed with either of the following scales in five datasets.
 - a) 4 items from the CSI:
 1. Please indicate the degree of happiness, all things considered, of your relationship.
 2. I have a warm and comfortable relationship with my partner.
 3. How rewarding is your relationship with your partner?
 4. In general, how satisfied are you with your relationship?
 - b) 3 items from the PRQC:
 1. How satisfied are you with your relationship?
 2. How content are you with your relationship?
 3. How happy are you with your relationship?
 - **Commitment.** Commitment was assessed with either of the following scales in six datasets:
 - a) 7 items from the "Commitment" subscale of the IMS:
 1. I want our relationship to last for a very long time.
 2. I am committed to maintaining my relationship with my partner.
 3. I would not feel very upset if our relationship were to end in the near future.
 4. It is likely that I will date someone other than my partner within the next year.
 5. I feel very attached to our relationship.
 6. I want our relationship to last forever.
 7. I am oriented toward the long-term future of my relationship (for example, I imagine being with my partner several years from now).
 - b) 3 items from the PRQC:
 1. How committed are you to your relationship?
 2. How dedicated are you to your relationship?
 3. How devoted are you to your relationship?

Transformations: Actor and partner gratitude will be grand mean centered prior to analyses.

Sample size: Sample size varies from 72 to 118 couples in the six datasets.

References

- Curran, P. J., & Hussong, A. M. (2009). Integrative data analysis: the simultaneous analysis of multiple data sets. *Psychological Methods*, 14, 81-100.
- Edwards, J. R. (2002). Alternatives to difference scores: Polynomial regression analysis and response surface methodology. In F. Drasgow & N. W. Schmitt (Eds.), *Advances in measurement and data analysis* (pp. 350 – 400). San Francisco: Jossey-Bass.
- Edwards, J. R., & Parry, M. E. (1993). On the use of polynomial regression equations as an alternative to difference scores in organizational research. *Academy of Management Journal*, 36, 1577-1613.
- Fleenor, J. W., McCauley, C. D., & Brutus, S. (1996). Self-other rating agreement and leader effectiveness. *The Leadership Quarterly*, 7, 487-506.
- Humberg, S., Nestler, S., & Back, M. D. (2019). Response surface analysis in personality and social psychology: Checklist and clarifications for the case of congruence hypotheses. *Social Psychological and Personality Science*, 10, 409-419.
- Humberg, S., Schönbrodt, F. D., Back, M. D., & Nestler, S. (in press). Cubic response surface analysis: Investigating asymmetric and level-dependent congruence effects with third-order polynomial models. *Psychological Methods*. doi:10.1037/met0000352
- McNulty, J. K., & Dugas, A. (2019). A dyadic perspective on gratitude sheds light on both its benefits and its costs: Evidence that low gratitude acts as a “weak link”. *Journal of Family Psychology*, 33, 876–881
- Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling and more. Version 0.5–12 (BETA). *Journal of Statistical Software*, 48, 1-36.
- Schönbrodt, F. D., Humberg, S., Nestler, S., & Carlson, E. (2018). Testing similarity effects with dyadic response surface analysis. *European Journal of Personality*, 32, 627-641.