

Emotional Coregulation Patterns of Romantic Partners

Romantik Partnerlerin Duygusal Ortak Düzenleme Örüntüleri

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Abstract: This study aims to examine the coregulation patterns in the positive and negative affect of normative romantic partners and to replicate the previous findings in the emotion regulation field. For this aim, 37 romantic couples (74 individuals) completed daily records for 14 consecutive days. We hypothesized that one's daily positive/negative affect would be positively associated with the partner's daily positive/negative affect. We also expected that changes in one's daily positive/negative affect would be positively associated with changes in the partner's daily positive/negative affect. The hypothesis was partially supported, as results of multilevel analyses revealed that partners' daily positive and negative affect positively predict one's own positive and negative affect. Moreover, change in partners' positive affect positively predicted one's own change in positive affect. Change in partners' negative affect did not predict one's own change in negative affect. Overall, the findings demonstrated the coregulation pattern in positive affect but not for negative affect for romantic dyads. The findings made an important contribution to the field of emotion regulation by replicating previous findings and providing further evidence for the emotional coregulation of romantic couples.

Keywords: Coregulation, Positive and Negative Affect, Romantic Partners, Diary Study

Öz: Bu çalışmanın amacı, normatif romantik partnerlerin olumlu ve olumsuz duygulanımlarında ortak düzenleme (coregulation) örüntülerini incelemek ve duygu düzenleme alanındaki önceki bulguları tekrarlamaktır. Bu amaçla, 37 romantik çift (74 kişi) ardışık 14 gün boyunca günlük kayıtları tamamlamıştır. Hipotezimiz, kişinin günlük olumlu / olumsuz duygularının, partnerinin günlük olumlu / olumsuz duygularıyla olumlu bir şekilde ilişkili olacağı idi. Ayrıca, kişinin kendi olumlu / olumsuz duygularındaki günlük değişimlerin, partnerinin olumlu / olumsuz duygularındaki günlük değişimlerle pozitif olarak ilişkili olacağı idi. Hipotez kısmen desteklenmiş, çok düzeyli analizlerin sonuçları partnerlerin günlük olumlu ve olumsuz duygularının, kişinin kendi olumlu ve olumsuz duygularını pozitif olarak yordadığını göstermiştir. Ayrıca, partnerlerin olumlu duygularındaki günlük değişimler ise, kişinin kendi olumlu duygularındaki günlük değişimlerini pozitif yönde yordamıştır. Ancak partnerlerin olumsuz duygularındaki günlük değişimler, kişinin kendi olumsuz duygularındaki değişimlerle ilişkili bulunmamıştır. Sonuç olarak, bulgular ortak düzenleme örüntüsünü olumlu duygular için desteklerken olumsuz duygular için desteklememektedir. Bu sonuçlar, önceki bulguları tekrarlayarak ve romantik çiftlerin duygusal ortak düzenleme çalışmalarına daha fazla kanıt sağlayarak, duygu düzenleme alanına önemli bir katkı sağlamıştır.

Anahtar kelimeler: Ortak Düzenleme, Olumlu ve Olumsuz Duygulanım, Romantik Çiftler, Günlük Çalışması

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Emotions are reactions to a constantly changing world, and most emotions take place within the context of social interactions or relationships (Butler 2015, 1). More specifically, emotions play a significant role in developing and maintaining close relationships (Schoebi & Randall 2015, 1) by motivating people to form intimate bonds, organize subsequent interactions and inform the intimate partners' each other's relational needs (Keltner & Haidt 1999, 510). Since close relationships are predicated on high physical, cognitive, and emotional closeness between partners (Schoebi & Randall 2015, 1); the regulation of the emotions is not just an individual process but also influenced by social interactions with intimate partners (Sbarra & Hazan 2008, 157; see Butler 2011). For instance, social partners' emotions become coordinated and stimulate each other during arguments or love affairs (Butler 2015, 1). Regulation of these interpersonal processes such as ability to affect the occurrence, duration, and intensity of emotions has a pivotal role in psychological and relationship functioning (Diamond & Aspinwall 2003, 147; Butler & Randall 2013, 202) and has implications for individual well-being (Reis, 2013). Indeed, all sorts of emotional reactions generated within close relationships motivate and direct relational behaviors (Schoebi & Randall 2015, 5; Butler 2017, 131-132). In other words, each partner's emotional responses to relational needs, and their partner's feedback contribute to the coordination of further interactions. Furthermore, high-quality affective relationships were found to be linked with a range of positive health consequences for relationship partners (Sbarra & Coan 2018, 41). Recently, the importance of affective reactivity, defined as individual's within-person associations between daily stress and affect, for married couples were shown in a longitudinal study as emotional reactions and emotion regulation capacity tend to give shape marital processes (Ong *et al.* 2019). The results of the study revealed not only that the heightened affective reactivity predicts lower marital quality but also physiological correlates of it. Thus, it can be concluded that emotional reactions and regulation of the reactivities are directly linked with the relational processes.

In the child development field, the interpersonal emotion regulation phenomenon called "coregulation" refers to a dyadic emotional system of an adult and infant, and co-constructing optimal affective states during social interactions (Tronick 1989; Feldman 2003, 3). A growing body of literature has investigated this adult-child emotional regulation system (e.g. Feldman 2015; Lunkenheimer *et al.* 2015; Beebe *et al.* 2016). However, there has been less research attention directed toward emotion coregulation and its effects on interpersonal processes for adults (Butler & Randall 2013, 1). In the limited work, the way romantic relationships contribute to emotion regulation (e.g., Beckes & Coan 2011; Zaki & Williams 2013) and implications of emotional experiences for intimate relationships (e.g., Reis & Shaver 1988; Gottman 1993; Bradbury *et al.* 2000) were the most widely studied topics (Schoebi & Randall 2015, 1-2). Recently, dyadic patterns of emotion regulation in romantic relationships were more a topic of inquiry. In these studies, associations of physiological signals within romantic couples (e.g., Helm *et al.* 2012; Reed *et al.* 2013), the relationship between attachment styles and emotion transmission, and dyadic patterns of emotion coordination and cooperation (Randall & Butler 2013, 6) were investigated. Although these studies shed light on the dyadic nature of emotion regulation in romantic relationships, more research for emotion coregulation in adult literature, especially for romantic couples, can still provide useful information on interdependence in partners' emotional changes.

Coregulation

Coupling patterns of emotions for dyads has been defined by different scholars and investigated by using different methods. From an attachment theory perspective, coregulation is reciprocally keeping psychophysiological homeostasis within a relationship (see Sbarra & Hazan 2008). As a proper and emergent feature of all clear-cut attachment relationships, emotional and physiological coregulation has an adaptive value for individuals (Hazan *et al.* 2004). In another

view, coregulation is defined as a kind of balanced state that includes people's affective oscillations mutually converging towards a stable state or diverging away from that state (Butler & Randall 2013, 203; Butler 2015, 1).

There have been studies which have supportive findings about coupling patterns of emotions within romantic relationships. In one of the preliminary works for the coregulation using physiological measurements for romantic couples, a positive link among romantic dyads' cortisol levels was found (Saxbe & Repetti 2010). Also, although individuals' positive mood did not predict their partners' positive or negative mood, their negative mood predicted partners' negative mood (Saxbe & Repetti 2010, 96-98). In another study, it was found that emotional reactions of romantic dyads became more similar within time (Anderson *et al.* 2003, 1057-159). Further, romantic partners' daily levels of positive and negative affect covaried, after controlling for the positivity or negativity of partners' daily interactions (Butner *et al.* 2007, 438-450). In addition to this, dual smoker romantic couples' emotional experiences also converged during an experimental study (Rohrbaugh *et al.* 2009, 61-63). These findings suggested a coregulation pattern referring bidirectional linkage of oscillating affective transmission between partners.

Attachment theory emphasizes biological interdependence when defining coregulation concept (see Sbarra & Hazan 2008), and prior work present evidence for coregulation in romantic partners, as romantic couples demonstrate positive partner effects on heart rate variability (Helm *et al.* 2012; 2014). Heart rate variability is mostly as an index of emotion regulation capacity and flexibility, and it was argued that the emotional interdependence of romantic couples is not only important for relational behaviors but also may have health protective function (Sbarra & Coan 2018, 43).

The Current Study

Although previous studies achieved to show coregulation patterns of romantic couples (e.g., Butner *et al.* 2007; Diamond *et al.* 2008; Steele & Ferrer 2011; Randall & Butler 2013; Sels *et al.* 2016), there are empirical contradictions in those studies. For instance, in one study, married couples showed covariation only in negative emotional experience (Saxbe & Repetti 2010). However, in another study only women's daily positive affect was influenced by partner's positive affect, whereas there was no association among partners' negative affect (Steele & Ferrer 2011, 977-980). Moreover, in one study, only 36 % of the couples demonstrated noteworthy emotional interdependence (Sels *et al.* 2016, 5-9). Prior work highlighted that findings regarding interpersonal emotional dynamics are often complex and ambiguous, and tried to clarify the theoretical side of the topic and make an effort to explain these empirical contradictions by re-conceptualizing emotional (inter)connectedness (Butler 2015, 4; 2017, 132). Another explanation for these contradictions might be that notable portions of the findings regarding coregulation come from clinical and/or non-normative couples (e.g., long-distance couples, couples in which one or both of the partners have physical or psychological illnesses) (Fisher *et al.* 2017). Hence, there is still need for more evidence to demonstrate the nature of this interpersonal temporal system over time, starting with normative couples' daily lives. Thus, the primary aim of this paper is to investigate coregulation of normative romantic partners' (i.e., heterosexual romantic relationships including physically and psychologically healthy partners) emotions.

Although there is a growing body of work on coregulation in the literature, research on dyadic patterns of emotional interdependence in couples in Turkish culture is rather scarce. To better understand close relationships and interpret relational behaviors and interconnecting emotions of romantic partners within Turkish culture, more research is preferred. Hence, the other major importance of this study is that it investigates coregulation in a Turkish sample.

Since previous work (Butler 2011, 20; 2017, 1) suggested the methods of providing interdependence between two partners' changes over time to understand emotions coupled between partners and emotions' nature of interpersonal temporal systems, a daily diary method was used for the present study. This method was used in previous studies (Butner *et al.* 2007; Diamond *et al.* 2008; Randall & Butler 2013), and the clearest example of emotion coregulation came from Butner and colleagues' (2007) work. In their work, 48 couples participated in a 21-day diary study and coregulation for both positive affect and negative affect was observed. We followed a similar research design and conducted a 14-day dyadic diary study to try to replicate these previous findings. We also followed a similar operationalization of coregulation as in previous work (Butner *et al.* 2007), which is the daily association in partners' levels of positive and negative affect, and association of changes in partners' daily positive and negative affect. In this regard, our hypothesis was as follows:

Hypothesis: One's daily positive/negative affect is positively associated with partner's daily positive/negative affect. Also, changes in one's daily positive/negative affect is positively associated with changes in partner's daily positive/negative affect.

Method

Participants

We planned to collect data from university students and their romantic partners for two semesters. A total of 39 heterosexual couples (78 individuals) in a romantic relationship for at least six months participated in the study. Participants were recruited from undergraduate courses at a state university in Ankara, and one partner from each couple received bonus points in their courses for participation. 4 participants were excluded from the sample, as they failed to complete baseline questionnaires or at least 3 daily records. 37 couples (74 individuals) completed the study. While mean age for females was 21.6 ($SD = 2.05$), mean age for males was 22.89 ($SD = 3.83$). Relationship duration of the couples ranged between 8 months and 60 months ($M = 21.32$, $SD = 14.91$).

Procedure

There were two phases in the study: an orientation session, and diary records for 14 consecutive days. In the orientation session, participants received identification codes and detailed information on completing diary records. They also completed a questionnaire package that included demographic information and person-level measures. The diary phase began the day after participants completed the baseline questionnaire package. Participants completed short, online records about their positive and negative affective states at the end of each day throughout 14 consecutive days. Number of completed records on average was 13.05 ($SD = .91$) for females, and 12.84 ($SD = 1.19$) for males.

Measures

Daily Positive and Negative Affect Schedule

We measured positive and negative affect with Positive and Negative Affect Schedule (PANAS) (Watson *et al.* 1988). The scale consists of 10 positive affective states (PA) (e.g. interested, excited, enthusiastic, and proud) and 10 negative affective states (NA) (e.g. upset, guilty, scared, hostile, and afraid). Participants rated the extent to which they experienced each state on a 1 (*not at all*) to 5 (*extremely*) scale. We within-person centered the scale items before computing daily reliabilities to remove the between-person effects. Daily reliabilities for positive affect ranged from .89 to .94, and the mean Cronbach alpha for the 14-day period was .92. Daily reliabilities for negative affect ranged from .90 to .94, and the mean Cronbach alpha for the 14-day period was .92. In addition to these reliabilities, within-person reliability scores of positive affect and negative affect were calculated, following prior work (Cranford *et al.*

2006; Gök *et al.* 2019). Within-person reliability for positive affect was found as .85, and for negative affect as .83.

Data Analytic Strategy

The data used in the present study was hierarchically nested, and it was suitable for multilevel analysis as the assumptions of normality and homoscedasticity were met. We used a multilevel model with two random intercepts and two random slopes (Bolger & Shrout 2007) to analyze the data and have separate estimates for females and males. We multiplied the female dummy-coded variable (1 for females and 0 for males) and the male dummy coded variable (1 for males and 0 for females) by a predictor to achieve these separate estimates. We reported female estimate using *bf*, and male estimate with *bm*.

To estimate the coefficients, we used SPSS 24 software. In daily analyses, day-level predictors were within-person centered and reported regression coefficients are unstandardized. In analyses with change scores, reported regression coefficients are standardized.

Results

Results for Coregulation

To test whether emotional coregulation exists among couples, we first examined whether partner's daily positive and negative affect was associated with one's own daily positive and negative affect, using models with two random intercepts and two random slopes. The equations for the models were as follows:

$$PA_{it} = \text{female dummy}_{it} [\pi_{f0i} + \pi_{m1i} (PA)_{it}] + \text{male dummy}_{it} [\pi_{m0i} + \pi_{f1i} (PA)_{it}]$$

$$NA_{it} = \text{female dummy}_{it} [\pi_{f0i} + \pi_{m1i} (NA)_{it}] + \text{male dummy}_{it} [\pi_{m0i} + \pi_{f1i} (NA)_{it}]$$

In daily analysis for positive affect, results showed that partner's daily positive affect positively predicted one's own daily positive affect (*bf* = .25, *SE* = .06, *p* < .001, 95% CI [.14, .36], *bm* = .19, *SE* = .04, *p* < .001, 95% CI [.10, .28]). In daily analysis for negative affect, results showed that partner's daily negative affect positively predicted one's own daily negative affect (*bf* = .26, *SE* = .06, *p* < .001, 95% CI [.14, .38], *bm* = .20, *SE* = .05, *p* < .001, 95% CI [.11, .29]). These findings (see Table 1 and Table 2) indicated that individuals reported higher positive affect on the days their partners reported higher positive affect; and individuals reported higher negative affect on the days their partners reported higher negative affect.

Table 1. Partner's Positive Affect Predicting One's Own Positive Affect

Variable	<i>b</i>	SE	<i>t</i>	[95% CI]
Intercept F	1.99***	.17	11.52	[1.65, 2.33]
Intercept M	2.24***	.14	16.03	[1.97, 2.52]
Positive Affect F	.25***	.06	4.45	[.14, .36]
Positive Affect M	.19***	.04	4.39	[.10, .28]

p* < .05, *p* < .01, ****p* < .001.

Table 2. Partner's Negative Affect Predicting One's Own Negative Affect

Variable	<i>b</i>	SE	<i>t</i>	[95% CI]
Intercept F	1.22***	.12	10.55	[.99, 1.45]
Intercept M	1.30***	.09	13.67	[1.11, 1.49]
Negative Affect F	.27***	.06	4.35	[.14, .38]
Negative Affect M	.20***	.05	4.40	[.11, .29]

p* < .05, *p* < .01, ****p* < .001

To examine whether changes in partner's positive and negative affect predict one's own changes in positive and negative affect, we used standardized residualized change scores for both partners. We regressed the current day's positive affect scores on the previous day's positive affect scores to create the change score for positive affect, and the current day's negative affect scores on the previous day's negative affect scores to create the change score for negative affect. Similar to the daily analyses, we used models with two random intercepts and two random slopes. The equations for the models were as following:

$$PACHn_{it} = \text{female dummy}_{it} [\pi_{f0i} + \pi_{m1i} (PACHn)_{it}] + \text{male dummy}_{it} [\pi_{m0i} + \pi_{f1i} (PACHn)_{it}]$$

$$NACHn_{it} = \text{female dummy}_{it} [\pi_{f0i} + \pi_{m1i} (NACHn)_{it}] + \text{male dummy}_{it} [\pi_{m0i} + \pi_{f1i} (NACHn)_{it}]$$

Results showed that partner's positive affect change positively predicted one's own positive affect change ($bf = .16$, $SE = .08$, $p = .034$, 95% CI [.01, .31], $bm = .13$, $SE = .06$, $p = .043$, 95% CI [.00, .25]). However, partner's negative affect change did not predict one's own negative affect change ($bf = .12$, $SE = .07$, $p = .081$, 95% CI [-.02, .26], $bm = .09$, $SE = .05$, $p = .088$, 95% CI [-.01, .19]), see Table 3 and Table 4.. These results indicated that when partners' positive affect change, individuals' positive affect also change. However, individuals' negative affect change is independent from their partners' negative affect change.

To make sure that these findings are unique to romantic couples and to eliminate the possibility of coregulation observation in any random couples, we built a new dataset using the same dataset with randomly assigning individuals to couples. Then, we tested the exact models as in analyses for romantic couples. Results showed no significant association between the variables in any of these models. Overall, these results partially supported our hypothesis; as couples coregulated their positive emotions whereas they did not coregulate their negative emotions.

Table 3. Partner's Positive Affect Change Predicting One's Own Positive Affect Change

Variable	<i>b</i>	SE	<i>t</i>	[95% CI]
Intercept F	-.03	.13	-.25	[-.28, .22]
Intercept M	.03	.12	.24	[-.21, .27]
Positive Affect Change F	.16*	.08	2.16	[.01, .31]
Positive Affect Change M	.13*	.06	2.10	[.00, .25]

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4. Partner's Negative Affect Change Predicting One's Own Negative Affect Change

Variable	<i>b</i>	SE	<i>t</i>	[95% CI]
Intercept F	.04	.12	.30	[-.20, .27]
Intercept M	.02	.11	.16	[-.21, .24]
Negative Affect Change F	.12	.07	1.77	[-.02, .26]
Negative Affect Change M	.09	.05	1.79	[-.01, .19]

* $p < .05$, ** $p < .01$, *** $p < .001$.

Discussion

In the present study, our aim was to investigate coregulation patterns of normative romantic partners' emotions in a Turkish sample by replicating previous studies. For this purpose, we also would like to provide evidence for coregulation in romantic partners. To this end, we observed the associations between partners' affect via daily diary method. Our study demonstrated that partners' daily affect predicted one's own daily affect. Moreover, changes in

partners' positive affect predicted the changes in one's own positive affect. Contrary to expectation, we did not find a significant link between changes in partners' negative affect. However, despite the insignificance, there is a trend in this hypothesized relationship. Small sample size might be the reason of insignificance. Nevertheless, these findings suggested that our hypothesis was partially supported. To increase the validation of our significant findings, we built a sample with assigning individuals to random couples and re-tested our hypothesis. As expected, we did not find any significant association between random partners' affects.

The present work contributes to literature with providing additional evidence for emotional coregulation among romantic dyads. Prior literature suggests the existence of emotional coregulation pattern for individuals in romantic relationships (Butler 2011; 2015; Butner *et al.* 2007; Saxbe & Repetti 2010; Sbarra & Hazan 2008), however, as mentioned previously, studies investigating coregulation involve some contradictions (e.g. Saxbe & Repetti 2010; Steele & Ferrer 2011; Bruder *et al.* 2012; Sels *et al.* 2016). Due to this incongruence of existing studies, re-examination of coregulation patterns of romantic couples is a significant contribution for the field. Some of our findings were in line with the previous work (e.g. Anderson *et al.* 2003; Rohrbaugh *et al.* 2009; Steele & Ferrer 2011) and demonstrated coregulation of positive emotions. However, we could not observe coregulation in negative affect. Still, our findings supported the idea that emotional coregulation is unique to people and their significant others such as parent-infant and romantic partners (see Butler 2001), as neither daily analyses nor analyses with change scores among random couples provided any evidence of coregulation.

One other beneficial aspect of our research is its replication value for coregulation studies. Recently, replication studies in psychology research started to gain major importance (for a detailed discussion see Zwaan *et al.* 2018). In that sense, our study can be perceived as a replication attempt for Butner and colleagues' (2007) research as they are remarkably similar in terms of both theoretical approach and methodology. Our study replicated the Butner and colleagues' (2007) findings regarding coregulation in positive affect, however we could not replicate the findings regarding coregulation in negative affect. One possible explanation for this situation may be the sample characteristics. Specifically, our sample had an average relationship length of 21 months, whereas the sample in Butner and colleagues' (2007) research had an average relationship length of 5 years. This difference in average length of relationships between samples could be the main reason behind failure in replication of their findings as mutual adjustment and awareness could be more likely to happen within long-term relationships (Butner *et al.* 2007).

Another contribution to the field is the usage of daily diary method. The previous work in the emotion regulation field suggested that emotions of romantic dyads are interpersonal temporal systems (Butler 2017, 1), and partners' emotional interdependence can best be observed in time (Butler 2011, 20). Hence, daily diary studies might be the best method to examine individuals' emotion regulation patterns with permitting to take both the temporal changes into account and their longitudinal aspects. Considering limited number of daily diary studies examining coregulation, the present study extends the body of work in this area.

The last contribution of the present work is exploring the emotional interdependence patterns of romantic couples in Turkish culture. In a different cultural setting, we did replicate previous findings, suggesting positive emotions are standard patterns of coregulation among romantic couples. As suggested in previous work (see Sels *et al.* 2016), romantic partners' emotional interdependence could be moderated by culture. Although cultural comparisons or cultural variations were not included in the present study, future national studies could focus on cultural factors in coregulation patterns.

Along with these contributions, our work has some limitations that should be considered. First limitation of the study is size of the sample used. Considering the difficulties in gathering longitudinal data from dyadic couples, the limited number of individuals (N=37 couples) was

understandable, however, it is still far from ideal. For reasons of generalizability, future studies might try to replicate our findings with a larger sample. Additionally, the sample in our study mostly consisted of non-married and non-cohabiting couples at a relatively young age, which restricts external validity of study findings. Also, one of the main reasons we could not observe coregulation in couples' negative affect change might be the nature of our sample. Married or cohabiting couples spend more time together, increasing the probability for mutual contact and emotion contagion. Prior work showed that couples' covariation in their affect is stronger on the days they spend more time together (Butner *et al.* 2007). In that sense, future studies might consider including both cohabiting and non-cohabiting couples to observe the regulation patterns better.

Another significant limitation in the present study is the third variable problem. A shared event experienced by couples may affect their reactions similarly. One of the mechanisms in affective process theory (see Elfenbein 2014) suggests that resembling emotions occur when individuals share the same affective experience. Also, after experiencing a shared emotional event, dyads may co-construct emotional meaning and share similar reactions to future emotional events (Butler 2015, 3-4). Thus, in future studies, researchers may focus on measuring couples' affective reactions to specific events and design studies accordingly.

One other limitation is the correlational nature of findings in the study. Although we collected data with daily diary method and conducted longitudinal analyses, it should not be forgotten that our findings are still correlational. To specify causal directions among emotion regulation patterns of romantic partners, studies with experimental procedures are needed.

The last limitation of the study is the wide range of participants' relationship duration. As romantic relationships progress, satisfaction derived from them declines over time (Clements *et al.* 1997; Mitnick *et al.* 2009). Similar effect of relationship duration may be valid for strength of coregulation between romantic partners as well. As sample's relationship duration becomes more spread, especially in small sample sizes, it makes harder comparing couples within early phases of their relationships with more established couples. Future research with larger sample sizes would benefit from comparing coregulation patterns of couples in different phases of their relationship.

In conclusion, our study replicated previous findings and provided further evidence for emotional coregulation among normative romantic couples. It seems that coregulation – especially in positive emotions- is the standard pattern of emotion regulation for individuals in romantic relationships.

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