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# Partner-Expected Affect: How You Feel Now Is Predicted by How Your Partner Thought You Felt Before

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Romantic partners can modulate each other's emotions in many ways, resulting in interwoven emotional lives. Here, building on findings from basic psychological research, we propose a novel way of such interconnectedness, termed partner-expected affect, in which perceptions of a partner's feelings may positively predict how this partner will actually feel at a later moment in time. We evaluated this hypothesis by means of an experience sampling study in which 100 romantic partners (50 couples) reported on the level of valence and arousal of their own feelings and of the perceived feelings of their partners 10 times a day throughout a week. In line with expectations, we found that how individuals were feeling at a particular moment was positively predicted by how their partner thought they felt at the previous moment (on top of how they felt at the previous moment and how their partner felt at the previous moment), at least when they had interacted with each other in between. This finding identifies a novel potential way in which people may shape each other's feelings and paves the way to further examine the nature and boundary conditions of such partner-expected affect.

*Keywords:* partner-expected affect, interpersonal emotion dynamics, interpersonal perception, self-fulfilling prophecy, emotional interdependence



Romantic relationships are central contexts for eliciting and regulating emotions (Berscheid & Ammazzalorso, 2001; Schoebi & Randall, 2015). Most research on interpersonal emotion dynamics in romantic relationships has focused on how partners' emotions align or impact one another's emotions over time. Partners' whole psychological lives, including their cognitions, perceptions, and behaviors, are intertwined, however, suggesting that partners may also interconnect and influence one another's feelings in other ways than by such emotion–emotion connections (Kelley et al., 1983). In this article, we propose such a new interpersonal pattern of how partners may shape each other's emotions. Specifically, we propose that how someone thinks their partner feels may predict the partner's actual feelings over time, so called partner-expected affect (PEA). In other words, peoples' beliefs about their partners' emotional experiences may predict the course of the actual experienced emotions in these partners.

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## How Do Romantic Partners Shape Each Other's Emotions Across Time?

In social psychology literature, social influences on people's emotional experience have been extensively documented and discussed (Fischer, Manstead, & Zaalberg, 2003; Manstead & Fischer, 2001; Parkinson, 2011; Peters & Kashima, 2015; Van Kleef, De Dreu, & Manstead, 2010). For instance, research on social appraisals shows that when individuals encounter an emotional event in the presence of another person, appraising the reactions of this person occurs automatically, and this other person is used as an information source to guide one's behaviors, feelings, and cognitions (e.g., Fischer et al., 2003; Jakobs, Manstead, & Fischer, 1996; Parkinson & Simons, 2009). Another example is research on emotion contagion, which shows that people can catch each other's emotions by mimicry (Hatfield, Cacioppo, & Rapson, 1994).

Such influences are expected to be particularly strong for people in close relationships, such as romantic relationships, as interdependence is considered one of its defining features (e.g., Kelley et al., 1983). Romantic partners are in an excellent position to modulate each other's emotion because their relationships are characterized by high physical proximity, mutual care and attention, and influence (Hatfield et al., 1994; Rusbult & Van Lange, 2003). Indeed, emotions are more often experienced and expressed in romantic relationships than in any other, and partners rely on each other to regulate their emotions (Berscheid & Ammazzalorso, 2001; Butler & Randall, 2013; Clark, Fitness, & Brissette, 2001).

Because of the extensive influences that partners exert on each other's emotions, interpersonal emotional linkages are expected to become visible over time. These interpersonal emotion dynamics have been examined in a number of ways. First, romantic partners can show concurrent interpersonal emotional associations across time. For instance, some partners demonstrate emotional syn-

chrony, which means that their emotions covary over time (e.g., Liu, Rovine, Klein, & Almeida, 2013; Papp, Pendry, Simon, & Adam, 2013; Saxbe & Repetti, 2010). Additionally, partners tend to evidence empathic accuracy in daily life, meaning that there is correspondence between what persons report to think and feel and what they according to their partner think and feel (Howland & Rafaeli, 2010; Ickes, 1997, 2003; Wilhelm & Perrez, 2004).

Next to concurrent associations, partners can show over time or temporal associations, such as linkages between partners' subsequent emotions (emotion transmission or contagion; e.g., Bolger, DeLongis, Kessler, & Wethington, 1989; Hatfield, Cacioppo, & Rapson, 1994; Larson & Almeida, 1999; Sels, Ceulemans, Bulteel, & Kuppens, 2016; Thompson & Bolger, 1999), and between partners' changes in emotions (coupling; Butner, Diamond, & Hicks, 2007). For instance, the anxiety experienced by an examinee before an upcoming exam can spillover to the partner, resulting in increased negative emotions (Thompson & Bolger, 1999). These temporal associations have often been interpreted as individuals' reactivity to their partner's emotions, and an indication of the extent of emotional influence taking place between partners (e.g., Thompson & Bolger, 1999). Finally, in times of stress, partners are expected to show coregulation, referring to a process in which partners' emotions are linked and mutually dampening over time, in this way regulating each other's emotions (Butler & Randall, 2013).

By demonstrating such temporal relations between partners' emotions, the research described above suggests the extensive power of partners to act upon the psychological state of their companions, even unintentionally (see Zaki & Williams, 2013, for the distinction between incidental and deliberate interpersonal emotion regulation). The efforts undertaken to examine these temporal emotion–emotion relations in close relationships research, however, may have turned attention away from other ways how partners may shape each other's emotions over time, involving for example partners' perceptions or behaviors. Not only a partner's emotions can guide someone's subsequent emotions (reflecting emotion transmission), but also this partner's cognitions and accompanying behaviors can steer the emotions that are subsequently experienced. To obtain a more complete picture of how emotions unfold in the dynamic context of social interactions and relationships, an explicit focus on interaction patterns besides emotional linkages would be beneficial.

## Partner-Expected Affect

We propose a new pathway through which we think a person (i.e., the target) is influenced by his or her romantic partner (i.e., the perceiver), namely by that partner's perception of the person's emotions. We propose that how people think their partner is feeling, will play through in how they interact with their partner, and will in turn impact the actual feelings experienced by the partner. Over time, we would expect this process to result in observable connections between people's perceptions and the experienced emotions in their partner. Specifically, we hypothesize that perceptions of a partner's emotions will positively predict the partner's (i.e., target's) emotions at a subsequent time point, resulting in assimilation toward these perceptions, and thus PEA. Such interdependence would aid partners to coordinate their behaviors toward each other.

One particular mechanism that may be responsible for PEA may be that of a self-fulfilling prophecy. Numerous experimental studies have demonstrated that induced perceptions can elicit confirmative behavior from strangers through interaction (cf. self-fulfilling prophecy theory and behavioral confirmation; Harris & Rosenthal, 1985; Merton, 1948; Snyder & Stukas, 1999; Snyder, Tanke, & Berscheid, 1977). In romantic relationships, specifically, self-reinforcing perceptions have shown to play an important role, with naturally occurring perceptions or expectations about one's partner predicting consequent assimilation of the partner toward these perceptions, and therefore influencing the subsequent interactions taking place (e.g., Drigotas, Rusbult, Wieselquist, & Whitton,1999; McNulty & Karney, 2002). For instance, some people perceive their partner to be rejecting more easily (and often even inaccurately), which leads them to treat their partner in a more hostile way, which in turn actually elicits hostility from the partner and consequently reinforces the perception (Downey, Freitas, Michaelis, & Khouri, 1998). Thus, people's perceptions about their partner are confirmed, not because they are accurate, but because they influence their own interaction behavior, which in turn impacts the partner's interaction behavior.

We expect a similar process for people's perceptions of their partner's emotions and this partner's subsequently experienced emotions. People commonly act on their beliefs and expectations, leading the perceiver to act as if his or her perceptions of the target's emotions were true (e.g., Harris & Rosenthal, 1985; Merton, 1948; Snyder & Stukas, 1999; Snyder, Tanke, & Berscheid, 1977). Based on literature on self-fulfilling prophecy (e.g., Harris & Rosenthal, 1985; Merton, 1948; Snyder & Stukas, 1999; Snyder et al., 1977), the perceiver's interaction behavior prompts the partner to behave in ways that confirm the perceiver's—often initially erroneous—beliefs. Much like the notion of behavioral confirmation (changes in behavior reflecting the beliefs of the perceiver; Snyder, 1992), we thus expect an emotional change. For instance, when people perceive their partner as irritated, defensive responses and behavior toward the partner can give the partner reasons to feel irritated indeed. On the contrary, when people perceive their partner as happy and joyful, this can make them act enthusiastically toward him or her, effectively eliciting positive emotions in the partner. Thus, because of people's interpretations of, and reactions to the perceived emotions, the perceptions can become self-fulfilling prophecies. Overestimations of emotions would then result in intensified emotional experiences, and underestimations in less intense emotional experiences.

An important underlying function of this self-fulfilling prophecy is that it regulates and facilitates social interaction for both target and perceiver (Snyder, 1992). Such coordinated interactions are especially important in romantic relationships (Baumeister & Leary, 1995; Berscheid & Ammazzalorso, 2001; Snyder & Stukas, 1999). Therefore, the target is not passive, but confirms expectations to facilitate the flow of interactions (Snyder & Haugen, 1995; Smith, Neuberg, Judice, & Biesanz, 1997). *Affiliative social tuning* refers to the specific phenomenon that when people are motivated to connect with one another (Which is especially the case in romantic relationships; Baumeister & Leary, 1995), they adjust their attitudes, beliefs, and emotions toward the person with whom they interact (Huntsinger, Lun, Sinclair, & Clore, 2009; Sinclair & Huntsinger, 2006; Sinclair, Huntsinger, Skorinko, & Hardin, 2005; Sinclair, Lowery, Hardin, & Colangelo, 2005). In this way, both

persons achieve a sense of mutual understanding, and a shared reality (Hardin & Conley, 2001; Hardin & Higgins, 1996).

### Differences With Existing Interpersonal Dynamics

With PEA, we focus on the unique effects of partner perceptions on people's emotions over time, operating next to emotional transfers that can occur between partners such as coregulation, emotion transmission, and so on (Butler & Randall, 2013; Bolger et al., 1989; Larson & Almeida, 1999). These perceptions do not have to be accurate, nonetheless leading to a movement of the target's emotion in the direction of the perceiver's expectation. Although in daily life, perceptions of partners' emotions have shown to be accurate (i.e., in agreement with partners' self-reported emotions), they are also biased by the perceiver's own emotions (called *projection* or *assumed similarity*; e.g., Clark, Von Culin, Clark-Polner, & Lemay, 2016; Kenny & Acitelli, 2001; Murray, Holmes, & Griffin, 1996; Wilhelm & Perrez, 2004). Additionally, people's perceptions of their relationship partner are guided by motivated construals, showing biases in function of self-protection, self-esteem maintenance, relationship satisfaction, and so on (e.g., Reis & Clark, 2013). People can be motivated to see certain emotions and not to see others, and thus to be inaccurate (e.g., Simpson, Ickes, & Blackstone, 1995). For instance, coming home after a day of hard work, individuals might be motivated not to perceive their partners' sadness. This underestimation of the partner's sadness would then impact the experienced sadness of the partner anyway through PEA.

In this way PEA distinguishes itself from other interpersonal phenomena in which an accurate perception of the emotion would result in dampening or amplification of the existing emotion. For instance, in phenomena such as support provision or dyadic coping, people would start acting supportive and empathic upon noticing that their partner is experiencing sadness, in this way diminishing experienced negativity in the target (e.g., Bodenmann, 1997; Cutrona, 1996). It also implies that PEA is distinct from specific phenomena that result in the amplification of existing emotions, such as capitalization (Gable, Reis, Impett, & Asher, 2004; Gable & Reis, 2010; Langston, 1994). In capitalization, people share good news with their partner, and elicit enthusiastic reactions of him or her, which results in even increased positive emotions.

### The Present Study

The aim of the present study is to verify if indeed PEA occurs. Are people's perceptions and their partner's experienced emotions intertwined over time? Answering this question will help us to obtain novel insights into the emotional exchange processes that take place between partners, and how people's emotions are embedded in their relational context.

We performed an experience sampling method study (ESM), with 100 romantic partners reporting on their own feelings and the perceived feelings of their partners 10 times a day throughout a week. This method allowed us to investigate if PEA occurs in a natural environment, and to assess interactions at the time of their occurrence rather than through retrospective report.

Because of the intensive sampling of participants, we preferred an assessment that allows for a relatively comprehensive emotion judgment of both own experience and partner perception without putting too much load on the participants, focusing on valence and arousal as two of the most fundamental dimensions of emotions (Russell, 2003). Valence refers to a subjective feeling of pleasantness or unpleasantness, ranging from pleasure to displeasure. Arousal refers to a subjective state of feeling activated or deactivated, ranging from feeling sleepy or quiet to feeling highly aroused. People's emotional experience and judgments of their partner's emotional experience in terms of these dimensions can be economically measured with an affect grid (Russell, Weiss, & Mendelsohn, 1989), a two-dimensional item measuring valence and arousal.

We hypothesized that how individuals were feeling at a particular moment, in terms of valence and arousal, would be positively predicted by how their partner thought they felt at the previous moment. Importantly, we hypothesized that PEA would occur independently of the accuracy of the initial perception and independently of emotional transfers. By including the target's own emotion at the previous time point, we can study PEA next to empathic accuracy, ensuring that findings cannot be explained by delayed effects of empathic accuracy that would have an influence through autocorrelation effects (carry over of own emotion from one moment to the next). Likewise, by including the partner's emotion at the previous time point, we can exclude that the PEA effect is due to partners projecting their own feelings on their judgment, and the target catching the partner's emotion. In other words, this ensures that over time, associations between partners' perceptions and experienced target emotions cannot be explained by judgments about partners' emotions being partly based on one's own emotional state (projection or assumed similarity). Finally, we hypothesized that PEA would emerge because of processes taking place during interactions between partners. If PEA is really about shaping each other's emotions by acting according to perceptions, it is expected to occur only when partners interact with each other. Therefore, we hypothesized that contact between partners in between assessments would moderate PEA.

In summary, we explored whether people's perceptions of their partner's emotions would subsequently influence the partner's actual feelings over time; more specifically, that this partner emotions would move in the direction of the perceived emotional state over time; that this would happen only when couples had been interacting; and that this effect would occur independent of emotion transfers, and empathic accuracy effects.

## Method

### Participants

Participants were recruited as part of a larger study investigating emotions in romantic relationships (see Erbas, Sels, Ceulemans, & Kuppens, 2016; Sels, Ceulemans, Bulteel, & Kuppens, 2016). The sample consisted of 50 heterosexual couples (100 participants) who were recruited through social media, and flyers and ads in community and relationship therapy centers. Participating couples had to meet the following criteria: (a) in a relationship for at least 2 months, (b) heterosexual, (c) over the age of 18, and (d) both partners willing to participate in the study. We selected the final couples based on age, relationship duration, and cohabitation status, to obtain a sample with sufficient variation in these demographic variables. Ultimately, age ranged from 18 to 70 years

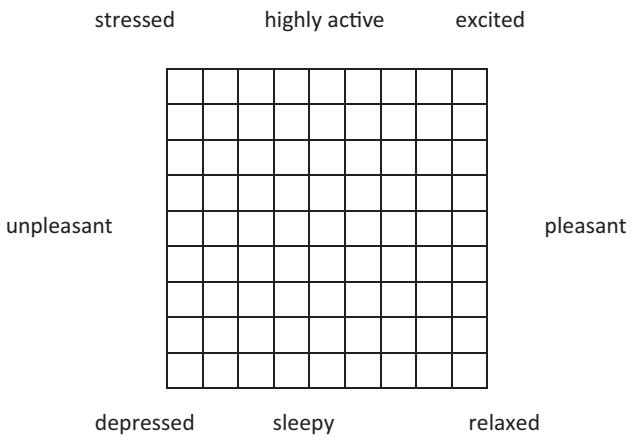


*Figure 1.* The affect grid used to assess momentary self- and partner-experienced core affect. From "Affect Grid: A Single-Item Scale of Pleasure and Arousal," by J. A. Russell, A. Weiss, & G. A. Mendelsohn, 1989, *Journal of Personality and Social Psychology*, *57*, p. 494. Copyright 1989 by the American Psychological Association. Reprinted with permission.

($M$ = 27.75 years, $SD$ = 10.60 years), and relationship length varied from 2 months to 35 years ($M$ = 72.06 months, $SD$ = 107.79 months). Ten of the couples were married, 18 couples were not married, but lived together, and 22 couples lived separately. Upon completion, each participant was paid 40 euros for participation.

## Procedure and Materials

In an initial session, couples received standardized information about the study, gave their informed consent, and completed several questionnaires (e.g., about relationship satisfaction, personal traits). Subsequently, each partner received a Motorola Defy Plus smartphone, learned how to use it, and learned how to answer the ESM questions. For 7 consecutive days, participants were beeped 10 times a day between 10 a.m. and 10 p.m. This interval was divided into 10 equal intervals with one signal being programmed randomly in each interval. On average, signals were separated by each other with 1 hr, 12 min, and 12 s ($SD$ = 29 min and 2 s). Within each couple, partners were signaled simultaneously, but the order of questions was random to avoid cooperation in answering the questions. Compliance was high: overall, participants responded to 92.03% of the beeps ($M$ = 64.40 signals, $SD$ = 7.15 signals). Among other questions, participants were asked each signal to complete two affect grids.

The one-item affect grid (Russell et al., 1989) is a two-dimensional grid, consisting of a 9 × 9 matrix. The horizontal axis represents valence, and the vertical axis represents arousal. Figure 1 presents an example of the affect grid. The center of this matrix represents a neutral feeling. To facilitate interpretation of the grid, affective labels were attached to every end- and midpoint. The upper midpoint was labeled "highly active," the lower midpoint was labeled "sleepy," the left midpoint was labeled "unpleasant," and the right midpoint was labeled "pleasant." At the upper right corner, "excited" represented an example for an emotion with high activation and positive valence. At the lower right corner, "relaxed" represented an example for an emotion with low activation and positive valence. At the lower left corner, "depressed" represented an example for an emotion with low activation and negative valence. At the upper left corner, "stressed" represented an example for an emotion with high activation and negative valence. Participants were told in the initial session how to interpret the grid.

For one of the two presented grids, participants were asked to mark the position that best represented how they felt at that moment. For the other grid, they were asked to mark the position they thought corresponded best with how their partner was feeling at that moment. In this way, we obtained four ratings for each participant (eight ratings per couple) at each sampling moment: a rating for own valence, a rating for own arousal, a rating for the perception of the partner's valence, and a rating for the perception of the partner's arousal. Valence was recoded into values ranging from −4 to 4, and arousal into values ranging from 0 to 8. Both affect grids were presented in random order and separately among the other experience sampling items. During the initial sessions, we informed participants carefully about how to interpret and fill out such grid.

At each sampling moment, participants also indicated whether they had been in contact with their partner since the last beep (recoded into 1 = yes and 0 = no). Beeps for which at least one participant indicated that he or she had been in contact with the partner were labeled as "contact." On average, participants reported that they had been interacting with their partner 73% of the time. In total, this resulted in 4,838 of the 6,052 answered beeps for which couples reported to have been interacting with their partner.

## Preliminary Analyses

Table 1 presents the descriptive statistics for key variables, aggregated across all reports for each person. To examine how frequently participants reported experiencing positive versus neg-

Table 1
*Means, Standard Deviations, and Correlations for Key Variables (Aggregated Across Persons)*

| | Women | | Men | | Women | | | | Men | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | *M* | *SD* | *M* | *SD* | V | PV | A | PA | V | PV | A | PA |
| Valence | 1.13 | .71 | 1.41 | .87 | — | | | | — | | | |
| Perception of partner's valence | 1.19 | .86 | 1.25 | .70 | .58** | — | | | .65** | — | | |
| Arousal | 3.89 | .69 | 3.82 | .77 | .02 | .03 | — | | −.49** | −.35* | — | |
| Perception of partner's arousal | 4.24 | .86 | 3.85 | .76 | −.05 | −.17 | .52** | — | −.34* | −.32* | .60** | — |

*Note.* V = valence; PV = partner's valence; A = arousal; PA = partner's arousal.
* $p < .05$. ** $p < .01$.

ative affect, we assigned self-reported valence to "negative affect" when participants reported an experienced valence below zero or equal to zero, and to "positive affect" when it was above zero. Even with zero included in negative affect (accounting for 13% of the cases), participants reported experiencing positive affect two thirds of the time (67.2%).

In 20.1% of the cases, perceivers correctly derived the target's experienced valence; in 38.2% there was an overestimation of the target's valence, and in 41.7% an underestimation. For arousal, perceivers correctly derived the target's experienced arousal 17.5% of the time, 43.8% of the time they overestimated it, and 38.7% of the time they underestimated it.

On average, however, the target's valence at time $t - 1$ and the partner's perception of the target's valence at time $t - 1$ did not differ significantly from each other, $t(5{,}417) = -1.61$, $p = .107$, indicating that perceivers were on average fairly accurate for their partner's valence level. For arousal, perceivers slightly overestimated their partner's arousal on average, with $t(5{,}417) = 5.70$, $p < .001$. In 18.4% of the cases, the actual valence and the perceived valence were opposite. In 8.8% of the cases, the perceived valence at time $t - 1$ was negative while the target's actual experienced valence at time $t - 1$ was positive, and in 9.6% of the cases, the opposite occurred.

## Data-Analytic Procedure

To test the hypothesized existence and direction of PEA, we estimated multilevel models in which we modeled self-reported affect as a function of PEA. To ensure that PEA would occur independent of emotional transfers and empathic accuracy effects, we controlled for both the partner's and the target's previous emotional experience. We applied overtime actor–partner interdependence modeling (Bolger & Laurenceau, 2013; Cook & Kenny, 2005; Kenny, Kashy, & Cook, 2006) to account for the dependencies arising from repeated measures nested within individuals (Level 1), who were then nested in dyads (Level 2). Analyses were conducted separately for valence and for arousal. For instance, self-reported valence of the target at time $t$ was predicted by self-reported valence at time $t - 1$ (reflecting autocorrelation), the partner's valence at time $t - 1$ (reflecting emotion transmission) and the partner's perception of the target's valence at time $t - 1$ (reflecting PEA). In this way, a positive coefficient for PEA would mean that the target moves toward the perceiver's expectation (whereas a negative coefficient would indicate a movement away from the expectation). Similar models were fitted for arousal. Lagged variables were created, so that time $t - 1$ and time $t$ refer to two consecutive signals within the same day (thus excluding overnight lagged effects), and variables were within-person centered to only reflect within-person change. We used a two-intercept model to simultaneously model men and women, which means that we included two dummy variables, one for men and one for women, and dropped the general intercept. Separate intercepts and slopes for men and women were estimated, producing separate male and female coefficients for autocorrelation, emotion transmission, and PEA (see Model 1). We allowed random intercepts for male and female members, and the correlation between these terms. To control for linear time effects within a day, a variable was included that represented the number of minutes that passed since the first beep of the day. An example of the syntax for SPSS is included in the Appendix.

## Model 1

$$\begin{aligned}\text{Valence actor}_{tjg} = {} & \beta_{0jmale} + \beta_{1male}(\text{valence of target})_{t-1jmale} \\ & + \beta_{2male}(\text{partner's valence})_{t-1jmale} \\ & + \beta_{3\text{male}}(\text{perceived valence by partner})_{t-1jmale} + \beta_{0jfemale} \\ & + \beta_{1female}(\text{valence of target})_{t-1jfemale} \\ & + \beta_{2female}(\text{partner's valence})_{t-1jfemale} \\ & + \beta_{3female}(\text{perceived valence by partner})_{t-1jfemale}\end{aligned}$$

To investigate if we only find PEA when couples have been interacting between the time of a partner's perception and subsequent experienced affect in the target, we next modeled the coefficients representing autocorrelation, emotion transmission, PEA, and time as a function of two dummy variables. These dummy variables indicated whether couples had been in contact since the last signal or not, and allowed estimating the effects separately for the moments that couples had been in touch opposed to when they had not. Again, fixed and random effects were modeled separately for men and women. We allowed random male and female intercepts that were estimated for moments in which partners did not interact to be correlated, and did the same for random male and female intercepts estimated for moments in which partner did interact.

# Results

## Valence

In both men and women, targets' self-reported valence at time $t - 1$ positively predicted their self-reported valence at time $t$ (see Model 1, Table 2), reflecting that people's experienced pleasantness is autocorrelated and carries over from one moment to the next. Perceivers' self-reported valence at time $t - 1$ also positively predicted targets' self-reported valence at time $t$. This means that men and women experienced more pleasurable feelings at time $t$ when their partner was experiencing more pleasure some time before, suggesting emotion transmission. Finally, and central to our research question, partners' perceptions of the target's valence at time $t - 1$ positively predicted the target's valence at time $t$. This was the case for both men and women. Hence, how pleasant people felt was positively predicted by how pleasant their partner thought they were feeling before, effectively showing evidence for PEA effects, with people's valence moving toward the perceiver's perception.

When contact was included in the model (see Model 2, Table 2), targets' valence at time $t - 1$ positively predicted their valence at time $t$ irrespective of contact with their partner and irrespective of gender. This means that targets' pleasant feelings carried over from one moment to the next, indicating autocorrelation, and that this happened independent of having been interacting with their partner. For emotion transmission, perceivers' valence at time $t - 1$ positively predicted targets' valence at time $t$ in both men and women, but only when they had been in touch with their partner in between. Partners' perceptions of the targets' valence at time $t -$

Table 2
*Multilevel Results for Participants' Valence at Time t*

| Valence at time *t* | Men β | Men *SE* | Men *t* | Men *p* | Men 95% CI | Women β | Women *SE* | Women *t* | Women *p* | Women 95% CI |
|---|---|---|---|---|---|---|---|---|---|---|
| Model 1 | | | | | | | | | | |
| Intercept | 1.26 | .14 | 9.19 | <.001 | [.98, 1.53] | 1.05 | .13 | 8.37 | <.001 | [.80, 1.30] |
| Autocorrelation | .27 | .03 | 12.38 | <.001 | [.23, .31] | .33 | .02 | 18.39 | <.001 | [.30, .37] |
| Emotion transmission | .05 | .02 | 2.55 | .011 | [.01, .08] | .06 | .02 | 2.92 | .003 | [.02, .11] |
| PEA | .07 | .02 | 3.46 | <.001 | [.03, .11] | .07 | .02 | 3.00 | .003 | [.02, .11] |
| Time | .00 | .00 | 3.25 | .001 | [.00, .00] | .00 | .00 | 2.09 | .037 | [.00, .00] |
| Model 2 | | | | | | | | | | |
| Contact | | | | | | | | | | |
| Intercept | 1.34 | .14 | 9.55 | <.001 | [1.07, 1.62] | 1.08 | .13 | 8.25 | <.001 | [.82, 1.34] |
| Autocorrelation | .26 | .03 | 10.16 | <.001 | [.21, .31] | .31 | .02 | 14.70 | <.001 | [.27, .35] |
| Emotion transmission | .05 | .02 | 2.31 | .021 | [.01, .09] | .05 | .03 | 1.93 | .054 | [−.00, .10] |
| PEA | .07 | .02 | 2.77 | .006 | [.02, .12] | .07 | .03 | 2.63 | .009 | [.02, .12] |
| Time | .00 | .00 | 2.39 | .017 | [.00, .00] | .00 | .00 | 2.04 | .041 | [.00, .00] |
| No contact | | | | | | | | | | |
| Intercept | 1.03 | .22 | 4.71 | <.001 | [.60, 1.47] | .96 | .20 | 4.73 | <.001 | [.56, 1.36] |
| Autocorrelation | .26 | .05 | 5.31 | <.001 | [.17, .36] | .43 | .04 | 9.81 | <.001 | [.34, .51] |
| Emotion transmission | .04 | .04 | .89 | .373 | [−.05, .13] | .08 | .05 | 1.48 | .140 | [−.02, .17] |
| PEA | .04 | .05 | .81 | .421 | [−.06, .15] | .03 | .05 | .62 | .534 | [−.07, .13] |
| Time | .00 | .00 | 1.38 | .167 | [−.00, .00] | .00 | .00 | −.09 | .931 | [−.00, .00] |

*Note.* Model 1 shows multilevel results for participants' valence at time *t*, predicted by own valence at time $t - 1$ (Autocorrelation), Partners' valence at time $t - 1$ (Emotion transmission), and partners' perception of participants' valence at time $t - 1$ (PEA), separately for men and women. Model 2 shows similar results, but separately for moments in which partners had been in contact with each other, versus when they had not. CI = confidence interval; PEA = partner-expected affect.

1 positively predicted the targets' valence at time *t* in men and women, again only when targets had been in contact with their partner in between, which is consistent with our hypothesis.[1]

## Arousal

Both male and female targets' self-reported arousal at time $t - 1$ positively predicted their self-reported arousal at time *t*, indicating autocorrelation of experienced activation (see Model 1, Table 3). For emotion transmission, there was no evidence that perceivers' self-reported arousal at time $t - 1$ predicted targets' self-reported arousal at time *t*. This indicates that male and female activation levels did not depend on partners' earlier activation levels. We did find evidence for PEA in men and women; perceptions of targets' arousal at time $t - 1$ positively predicted targets' arousal at time *t*, with the target moving toward the expectation of the partner.

We again investigated the role of contact by the inclusion of dummy variables (see Model 2, Table 3). Targets' arousal at time $t - 1$ positively predicted own arousal at time *t* in men and women, regardless of contact. There was no evidence for transmission of partners' arousal in men and women, and this was independent of contact. The perception of targets' arousal level at time $t - 1$ positively predicted these targets' arousal at time *t* when perceiver and target had been in contact with each other. This was found for both men and women. Hence, the target's activation level moved toward the partner's perception when target and perceiver had been interacting. When there was no contact between the two, there was a positive association between partners' perception and male targets' experienced arousal, and there was no association for female targets.[2]

## Follow-Up Analyses

To obtain more insight in the observed PEA effects, we conducted a number of additional analyses, focusing on valence. First, we investigated whether PEA occurred for both positive and negative affect. We modeled all coefficients as a function of two dummy variables that indicated whether experienced valence at time $t - 1$ was positive or negative, allowing estimating all effects separately for positive and negative valence. This revealed no effect of partner perception for negative valence in men ($\beta = 0.05$, $t = 1.47$, $p = .143$, 95% confidence interval [CI] [−0.02, 0.12]) nor in women ($\beta = 0.02$, $t = .50$, $p = .619$, 95% CI [−0.05, 0.09]), while partner perception positively predicted positive valence in men ($\beta = 0.07$, $t = 2.64$, $p = .008$, 95% CI [0.02, 0.12]) and women ($\beta = 0.10$, $t = 3.63$, $p < .001$, 95% CI [0.05, 0.16]). Hence, it seemed that PEA effects were mainly driven by experienced affect with a positive valence opposed to affect with a negative valence.

[1] We also estimated a model in which contact was more strictly defined, with participants only having been in contact if both partners reported that they had been in contact. This resulted in 768 observations that shifted from "contact" to "no contact." When this contact variable was included in the model, PEA effects remained equivalent, with perceptions of the target's valence at time $t - 1$ positively predicting the target's valence at time *t* only when targets had been in contact with their partner in between. It is notable, however, that with these models, emotion transmission effects were significantly positive only when partners had not been interacting with their partner in between.

[2] Again, we also performed a model in which contact was stricter defined. This model resulted in similar effects for PEA, autocorrelation, and emotion transmission.

Table 3
*Multilevel Results for Participants' Arousal at Time t*

| Arousal at time *t* | Men β | Men *SE* | Men *t* | Men *p* | Men 95% CI | Women β | Women *SE* | Women *t* | Women *p* | Women 95% CI |
|---|---|---|---|---|---|---|---|---|---|---|
| **Model 1** | | | | | | | | | | |
| Intercept | 4.14 | .13 | 32.43 | <.001 | [3.89, 4.40] | 4.22 | .12 | 33.98 | <.001 | [3.97, 4.47] |
| Autocorrelation | .25 | .02 | 12.03 | <.001 | [.21, .29] | .30 | .02 | 15.66 | <.001 | [.26, .33] |
| Emotion transmission | .01 | .02 | .63 | .530 | [−.03, .05] | .02 | .02 | .98 | .326 | [−.02, .06] |
| PEA | .09 | .02 | 4.31 | <.001 | [.05, .14] | .11 | .02 | 4.53 | <.001 | [.06, .15] |
| Time | −.00 | .00 | −4.93 | <.001 | [−.00, −.00] | −.00 | .00 | −5.02 | <.001 | [−.00, −.00] |
| **Model 2** | | | | | | | | | | |
| Contact | | | | | | | | | | |
| Intercept | 4.01 | .14 | 28.95 | <.001 | [3.74, 4.29] | 4.18 | .13 | 32.70 | <.001 | [3.93, 4.43] |
| Autocorrelation | .21 | .02 | 8.78 | <.001 | [.16, .25] | .27 | .02 | 12.60 | <.001 | [.23, .32] |
| Emotion transmission | .02 | .02 | .81 | .420 | [−.03, .06] | .02 | .02 | .83 | .406 | [−.03, .07] |
| PEA | .09 | .03 | 3.44 | <.001 | [.04, .14] | .12 | .03 | 4.47 | <.001 | [.07, .17] |
| Time | −.00 | .00 | −3.80 | <.001 | [−.00, −.00] | −.00 | .00 | −4.52 | <.001 | [−.00, −.00] |
| No contact | | | | | | | | | | |
| Intercept | 4.29 | .20 | 21.35 | <.001 | [3.89, 4.68] | 4.24 | .23 | 18.23 | <.001 | [3.78, 4.69] |
| Autocorrelation | .35 | .05 | 7.10 | <.001 | [.25, .44] | .33 | .05 | 7.29 | <.001 | [.24, .43] |
| Emotion transmission | .01 | .05 | .25 | .801 | [−.08, .10] | −.03 | .05 | −.56 | .574 | [−.13, .07] |
| PEA | .11 | .05 | 2.09 | .037 | [.01, .22] | .10 | .06 | 1.68 | .093 | [−.02, .21] |
| Time | −.00 | .00 | −1.86 | .063 | [−.00, .00] | −.00 | .00 | −.92 | .357 | [−.00, .00] |

*Note.* Model 1 shows multilevel results for participants' arousal at time *t*, predicted by own arousal at time $t - 1$ (Autocorrelation), partners' arousal at time $t - 1$ (Emotion transmission), and partners' perception of participants' arousal at time $t - 1$ (PEA), separately for men and women. Model 2 shows similar results, but separately for moments in which partners had been in contact with each other, versus when they had not. CI = confidence interval; PEA = partner-expected affect.

Second, to obtain more insight in the underlying processes of PEA, we investigated whether partners' over- versus underestimation of the target's previous affect led to amplification or dampening of the experienced affect. We looked into the discrepancy between the target's actual affect and the partner's perception at time $t - 1$, distinguishing between positive and negative affect. In this way, a positive beta would signify the extent of amplification because of overestimation, whereas underestimating the partner's valence would signify dampening. Specifically, the tested model is

$$\begin{aligned}\text{Valence actor}_{tjg} = {} & \beta_{0jmale*neg} + \beta_{1\text{male*neg}}(\text{valence of actor-perceived valence by partner})_{t-1jmale*neg} \\ & + \beta_{0jfemale*\text{neg}} \\ & + \beta_{1female*neg}(\text{valence of actor-perceived valence by partner})_{t-1jfemale*neg} \\ & + \beta_{0jmale*pos} \\ & + \beta_{1\text{male*}pos}(\text{perceived valence by partner-valence of actor})_{t-1jmale*pos} \\ & + \beta_{0jfemale*pos} \\ & + \beta_{1female*pos}(\text{perceived valence by partner-valence of actor})_{t-1jfemale*pos}\end{aligned}$$

We controlled for autocorrelation and time effects, and all (four) intercepts were random (allowing intercepts for men and women to be correlated). For negative valence, there was no effect of the discrepancy in men ($\beta = -0.04$, $t = -1.22$, $p = .22$, 95% CI [−0.10, 0.02]), nor in women ($\beta = -0.02$, $t = -0.63$, $p = .53$, 95% CI [−0.08, 0.04]). For positive valence, there was an amplification of positive affect when the perceiver overestimated experienced positive affect at time $t - 1$ in both men ($\beta = 0.06$, $t = 2.64$, $p = .008$, 95% CI [0.02, 0.12]) and women ($\beta = 0.10$, $t = 3.65$, $p < .001$, 95% CI [0.05, 0.15]). Hence, it seems that overestimating the partner's (mostly) positive valence ends up in an amplification of this partner's actual experienced valence, whereas underestimating the partner's valence results in dampening, confirming that PEA involves the partner's emotion moving toward the perceiver's predicted emotional state.

Subsequently, we examined whether the results for both valence and arousal held when controlling for age, relationship satisfaction, commitment, intimacy, and total relationship quality from the target and the perceiver.[3] Also, the between-couples variable relationship length was included as a control. However, including these variables did not change results for PEA effects (all *p*s < .01).

Finally, to investigate whether there were differences in PEA between couples living together versus apart, we included a dummy variable (1 = living apart, 0 = living together) as a main effect and as an interaction effect with PEA. This analysis revealed that PEA effects for valence diminished for women when they were not living together with their partner ($\beta = -0.12$, $t = -3.00$, $p = .003$, 95% CI [−0.20, −0.04]), whereas living apart as a couple did not significantly change the PEA effect for men ($\beta = -0.03$, $t = -0.70$, $p = .485$, 95% CI [−0.10, 0.05]). For arousal, PEA effects for partners that were living together did not differ significantly from PEA effects for partners living apart (for women, $\beta = -0.03$, $t = -0.75$, $p = .451$, 95% CI [−0.12, 0.05]; for men, $\beta = -0.05$, $t = -1.27$, $p = .204$, 95% CI [−0.13, 0.03]). One explanation for this finding is that couples who lived apart interacted as much with each other as couples who lived together, as shown by an independent samples *t* test ($M_{\text{living together}} = 0.79$, $SD_{\text{living together}} = 0.12$, and

[3] Next to demographic questions, participants also filled out other questionnaires beforehand. These questionnaires assessed several traits, relationship aspects, and so on.

$M_{\text{living separately}} = 0.82$, $SD_{\text{living separately}} = 0.13$), $t(48) = -0.86$, $p = .394$.[4]

## Discussion

The aim of this article was to examine the existence of PEA, which we believe is an untouched topic in the field of research on interpersonal emotion modulation processes. We expected and indeed found a positive relationship between people's perceptions about their partner's emotional experiences and how this partner actually felt the next moment. People tended to move toward the perceptions of their partner for both perceived valence and arousal. More concretely, how pleasant people felt (reflecting valence), was positively predicted by how pleasant their partner thought they were feeling previously, and this only when they had been in contact with each other in between. Additionally, how activated people felt (reflecting arousal) was positively predicted by how activated their partner thought they were feeling previously. While for men this remained significant when partners had not been in contact ($p = .037$), PEA effects were again not observed for women when they had not been in contact with their partner. A potential explanation for this unexpected finding with regards to arousal is that people tend to pay less attention to arousal than to valence when reporting on their own emotion (Feldman, 1995), and this also seems to be the case for reporting on others' emotions (Erbas et al., 2016; Totterdell, Kellett, Teuchmann, & Briner, 1998).

Overall, this moderation of PEA by contact suggests that it arises through interaction between the partners, and that it concerns an interpersonal modulation process. Importantly, the occurrence of PEA was observed independent of effects of how the target was feeling previously, excluding the possibility that the finding can be explained by mere delayed empathic accuracy. In this regard, it is also notable that perceivers were not accurate in the majority of the cases. Additionally, the direction of the observed PEA effects showed that the target's emotion moved toward the partner's perception over time. Together, this indicates that PEA originates from different emotional processes than existing interpersonal phenomena that lead to a counteraction or amplification of existing emotions, and that likely a self-fulfilling prophecy mechanism could be at play. Finally, PEA was observed on top of how the partner was feeling previously, excluding the possibility that it was fully mediated by the perceiver projecting his or her own experienced pleasantness on his or her judgment, and the target catching this perceiver's emotion. This also showed evidence for the existence of PEA on top of emotional transfers. In this study, the found PEA effects were mainly driven by PEA for positive affect. Overestimating the partner's positive valence ended up in an amplification of this partner's actual experienced valence, whereas underestimating the partner's positive valence resulted in dampening. The finding that PEA was most prominent for positive valence was most likely due to participants reporting feeling positive during the majority of the time (the so-called positivity offset; Cacioppo, Gardner, & Berntson, 1999).

Our study is consistent with research demonstrating emotional linkages between romantic partners in daily life (see Butler, 2015; Butler & Randall, 2013; Schoebi & Randall, 2015). At the same time, it extends the existing research on interpersonal emotion modulation and regulation dynamics by being the first to examine if the partner's perception of an individual's emotion changes the experienced emotion over time. In this way, it also complements broader research on the interaction between social contexts and emotions (Fischer et al., 2003; Manstead & Fischer, 2001; Parkinson, 2011; Peters & Kashima, 2015; Van Kleef et al., 2010). Apparently, people's emotions are not only predicted by how they perceive others' emotions (social appraisal processes), but also by how these others perceive their emotions. This finding helps to further untie the complex web of dynamic emotional processes unfolding within social contexts. Recently, there has been a call for including social relations in the study of emotional processes (Fischer & Van Kleef, 2010; Parkinson & Manstead, 2015). By proposing and observing a specific interpersonal process that takes place in the development of emotions during the course of interactions, we hope to have contributed to a more in-depth understanding of how emotions operate in the social world.

This study potentially demonstrates a new pathway in which partners mold each other's emotions. How individuals behave is guided by their perceptions, therefore impacting the interaction that takes place with the partner, and in turn also the behaviors, thoughts, and feelings of the partner. If the perception of a partner's emotion results in assimilation toward the perception during daily life, this might imply that people often start feeling worse or better than originally was the case due to their partner. On a more distal level, this can result in couples becoming locked in beneficial or destructive patterns. Whereas periodically overestimating a partner's positive affect can result in enhanced positive emotions and by consequence improved individual and relationship functioning, periodically underestimating this partner's positive affect is expected to have aversive consequences. Biases in perceptions of partners have indeed been shown to relate to well-being outcomes, with positively biased perceptions (the tendency to overestimate the partner's qualities) being associated with more relationship satisfaction (for a meta-analysis, see Fletcher & Kerr, 2010). Instead of focusing on how accurate couples are in deriving each other's emotions, it might thus be as important to focus on the biased perception itself, as this perception may have real emotional consequences for the partner. Finally, and speculatively, our findings might explain a new potential process through which people who encounter mood disruptions such as a depressive episode might elicit negative feelings in others (Coyne, 1976; Katz, Beach, & Joiner, 1999; Segrin & Dillard, 1992). As

[4] To investigate moderating conditions of PEA effects, we ran several multilevel analyses in which each time we included a potential moderator. In addition to the coefficients representing autocorrelation, PEA, and emotion transmission, every time the main effect of the potential moderator and an interaction with PEA was included. In this way, we investigated the potentially moderating effects of trait variables such as age, relationship satisfaction, relationship quality, relationship length, number of hours spent together during a week, reappraisal, suppression, perceived stress, empathic concern, and anxiety attachment. Additionally, we investigated two situational variables (assessed multiple times a day by experience sampling; within-person centered): self-confidence and stress. No consistent moderating effect was found for any of these variables (e.g., when an interaction effect with PEA was evident, this always seemed relevant for only one of the sexes).

individuals experiencing a depressive episode show a heightened attentional and interpretational bias for negative emotions in others (for an overview, see Bistricky, Ingram, & Atchley, 2011), they may be more likely to overestimate their partner's negative emotions, and underestimate their partner's positive emotions, which could result in congruent emotions in the partner.

This study is the first to examine the existence of PEA. As a result of this, further questions abound, with future research being necessary to further unravel (the extent of) its occurrence, its moderators, and its boundary conditions. The power of our study may have not been sufficient to detect such moderating and boundary conditions, especially for moderators that are between couples (e.g., cohabiting status). For future studies, it is recommended to conduct studies with larger samples, which would allow to obtain a more comprehensive image of PEA. Relatedly, even though we found that the prevalent type of PEA was a movement of the partner's affect in line with the partner's expectations, in some situations there may be no PEA, or even that that the partner's affect may run counter the partner's expectations. We would expect for instance that partner perceptions sometimes lead to controlled interpersonal emotion regulation behaviors that overrule the PEA effects and result in a downregulation of this partner's emotions (Dixon-Gordon, Bernecker, & Christensen, 2015; Netzer, Van Kleef, & Tamir, 2015; Niven, Totterdell, & Holman, 2009; Zaki & Williams, 2013). Additionally, because our analyses do not directly speak to underlying mechanisms, other mechanisms besides self-fulfilling prophecy can be at play as well. For example, when ambiguous emotional events take place, a target can use his or her romantic partners as an information source (in a different way than by social appraisal). The partner carries a perception of how the target is feeling and this perception becomes clear for the target by interacting. In this way, the legitimacy of the target's original emotion response can be (unconsciously) validated, intensifying the emotion in the target. The opposite can happen as well, however: The target may notice from the partner that the response is considered inappropriate or exaggerated, consequently correcting and blunting this emotion. Then, there may also be specific situations in which partner perceptions can be completely wrong; people sometimes conceal their true feelings (Rusbult, Verette, Whitney, Slovik, & Lipkus, 1991) or feign emotions (Clark, Pataki, & Carver, 1996) to their partner. On top of this, partners are sometimes even motivated to be inaccurate about each other's feelings, such as when the context is relationship threatening (Simpson et al., 1995; Simpson, Ickes, & Orina, 2001). Hence, future research is clearly needed to further disentangle the exact processes of PEA. Finally, the association we found between partner perceptions and real experienced affect is correlational, even though we tried to control for the direction of the association by using a lagged design. Experimental paradigms are, however, needed to make direct causal inferences, and to test if indeed a self-fulfilling prophecy mechanism accounts for the PEA effects, with the perceiver acting in line with his or her perception during interactions with the partner, resulting in assimilation of the partner toward this perception. An interesting avenue for future research would be to examine how induced or manipulated perceptions in one partner may affect the feelings or the other partner. Ideally, (a) the partner's perception of the target effectively would be manipulated, for instance by a priming task or false feedback about the partner' state, (b) both partners interact, and (c) subsequent effects on the target's feelings after interaction can be examined.

## Conclusion

In summary, the present study shows first evidence for partner-expected affect; peoples' perceptions about their partner's emotional experiences predict how this partner actually feels the next moment. By demonstrating this relationship, this study highlights a new form of interpersonal interdependence evident in partners during daily life. In this way, it further extends research showing that for a comprehensive understanding of one's emotional experience, one cannot ignore this person's social environment.

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## Appendix

## Modeling PEA in SPSS

MIXED valence WITH male female valence_1 P_valence_1 P_perception_valence_1 time
/FIXED = male valence_1 *male P_valence_1 *male P_perception_valence_1 *male time*male female valence_1 *female P_valence_1 *female P_perception_valence_1 *female time*female | NOINT SSTYPE(3)
/METHOD = REML
/PRINT = SOLUTION TESTCOV
/RANDOM = male female | SUBJECT(dyad) COVTYPE(UN).

The target's experienced valence is represented by "valence"; "valence_1" represents the target's lagged valence; "P_valence_1" represents the partner's lagged valence; and "P_perception_valence" represents the partner's lagged perception. All predictors are within-person centered. The number of minutes that passed since the first beep of the day is represented by "time," controlling for linear time trends in this way.

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