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Couples' Perceptions of Each Other's Daily Affect: Empathic Accuracy, Assumed Similarity, and Indirect Accuracy

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Abstract

This study examined couples' perceptions of each other's daily affect, using a daily diary methodology. Specifically, we tested the extent to which couples accurately inferred how their partner was feeling (empathic accuracy) and the extent to which spouses used their own feelings as a gauge for how their partner was feeling (assumed similarity). We also tested for indirect accuracy in couples' perceptions; that is, that assumed similarity in the context of actual similarity leads to empathic accuracy. Participants were 51 couples who completed daily diaries for seven consecutive nights. Results based on the Actor-Partner Interdependence Model indicated that couples showed both empathic accuracy and assumed similarity in their perception of their partner's positive affect; however, they used assumed similarity in rating their partner's hard negative (anger, hostility) and soft negative (sadness, fear) affect. Further, tests of indirect accuracy found that wives were indirectly accurate in perceiving their husbands' positive affect and both husbands and wives were indirectly accurate in perceiving each other's hard negative affect because they were biased. Complementing laboratory studies, the present study highlights that examining couples' perceptions of each other's feelings in contexts of daily life, and differentiating positive and negative emotions, can further our understanding of the role of emotions for healthy relationship functioning.

Keywords

daily affect; daily diary; empathic accuracy; assumed similarity; indirect accuracy

Emotions play a central role in the healthy functioning of intimate relationships, providing an internal gauge of a person's satisfaction with the relationship and organizing one's behavior toward their partner (Greenberg & Goldman, 2008). For example, Tashiro and Frazier (2007) found that couples who were induced to feel negative emotions used more negative conflict behavior, such as interrupting and criticizing their partner, in a subsequent interaction. Positive emotions, in contrast, have been linked to better conflict resolution, greater relationship satisfaction, and marital stability (Gable, Gonzaga, & Strachman, 2006;

Shiota, Campos, Keltner, & Hertenstein, 2004). Moreover, being emotionally attuned to one's partner, such that couples can accurately perceive and decipher what each other is feeling, is also important for healthy relationships. Indeed, mirroring and validating your partner's emotions is a critical component of many therapeutic approaches with couples (Greenberg & Goldman, 2008). This ability to be in tune with and accurately perceive your partner's thoughts and feelings—known as *empathic accuracy* (Ickes & Simpson, 1997)—has been implicated in positive relationship outcomes, such as greater accommodative behavior during conflict, better communication, providing support, and higher marital satisfaction (Cohen, Schulz, Weiss, & Waldinger, 2012; Howland, 2015; Kilpatrick, Bissonnette, & Rusbult, 2002; Luo & Snider, 2009; see also Sened, Lavidor, et al., 2017 meta-analysis).

Empathic accuracy is commonly operationalized as a difference score between how one rated themselves as feeling and how their partner perceived them to be feeling; lower scores reflect greater empathic accuracy. However, research has shown that couples also often assume their partner shares the same thoughts and feelings and, therefore, rely on their own feelings to judge how their partner feels—a perception bias known as *assumed similarity* or projection (Kenny & Acitelli, 2001). Further, accuracy in inferring your partner's emotions may arise not only because you are attuned to your partner's emotions, but also because you and your partner may happen to feel the same *and* you assumed similarity. Thus, higher empathic accuracy may be an artifact of assumed similarity. Kenny and colleagues (Kenny & Acitelli, 2001; West & Kenny, 2011) refer to this phenomena as *indirect accuracy*; that is, accuracy in perceiving your partner's feelings arises because of your bias, and not from being empathically attuned to your partner. There have been limited studies on spouses' ability to perceive their partner's emotions outside of a laboratory setting, taking into account both empathic accuracy and assumed similarity perceptions, as well as testing for indirect accuracy. The purpose of the present study was to examine couples' perceptions of their partner's daily positive and negative affect, using a daily diary methodology, in order to test the extent to which couples' perceptions of each other in everyday life are characterized by empathic accuracy, assumed similar, and indirect accuracy.

Partners' perception of each other has been studied in relation to personality factors and relationship factors such as commitment and closeness, emotional support, and conflict style (e.g., Bar-Kalifa, Rafeili, & Sened, 2016; Kenny & Acitelli, 2001; Thomas, Fletcher, & Lange, 1997; see Gagné & Lydon, 2004 for review). This research has shown that partners are both empathically accurate and biased in their perceptions of their partner; thus these two perceptions are not mutually exclusive (Acitelli, Douvan, & Verhoff, 1993; Kenny & Acitelli, 2001; Luo & Snider, 2009; Sadikaj, Moskowitz, & Zuroff, 2015). Further, in close relationships, there is evidence that perceptions of assumed similarity may be stronger when compared to empathic accuracy (Kenny & Acitelli, 2001; Schul & Vinokur, 2000).

With regard to perceptions of emotions, the majority of studies have assessed couples' perceptions during standard, laboratory-based discussion tasks (e.g., Papp, Kouros, & Cummings, 2010; Sanford, 2012; Simpson, Oriña, & Ickes, 2003). In this paradigm, couples are videotaped discussing a topic of disagreement or relationship issue; after the discussion, couples report how they felt and how they think their partner felt, either by reviewing the

videotape or filling out a post-interaction questionnaire. Papp et al. (2010) found significant empathic accuracy and assumed similarity in partners' ratings of each other's negative emotions, whereas assumed similarity was more consistently found for perceptions of their partners' positive emotions. Relatedly, couples are more likely to reciprocate their partner's negative emotions during conflict (Gaelick, Bodenhausen, & Wyer, 1985), further suggesting that couples may be more attuned to and accurate in perceiving negative emotions. However, this is not a consistent finding: Campos, Schoebi, Gonzaga, Gable, and Keltner (2015) found greater accuracy for positive emotions in dating couples compared to negative emotions, and Guthrie and Noller (1988) reported that spouses were accurate in perceiving their partners' emotional intent, regardless of the emotion, as long as they were satisfied in their marriage.

Together, these lab-based studies provide evidence that couples are attuned to their partners' positive and negative emotions, and they use both empathic accuracy and assumed similarity in their perceptions. However, these studies have all been in the context of a lab-based marital discussion, which is a face-to-face and potentially emotionally-charged discussion. It is unknown the extent to which these findings generalize to everyday life, when spouses may not be in constant communication and when it is not explicit the extent to which your partner's affect was elicited by or in reaction to the relationship. Whereas the previous studies have underscored the importance of perceiving relationship-relevant emotions (e.g., emotions elicited by one's partner or in response to an interaction with one's partner), emotions also occur outside the context of one's relationship. How couples can generally perceive their partner's daily affective mood is also important to understand given evidence that emotions outside of the relationship can spillover to uniquely affect marital functioning (Koerner & Fitzpatrick, 2002).

Diary methodology, in which participants complete a short survey each day, is an innovative method for capturing emotion in the ecologically-valid context of daily life (Bolger, Davis, & Rafaeli, 2003). This method can be modified to not only capture one's own feelings, but also perceptions of their partner's feelings. Only a handful of studies, however, have used diary methodology to explicitly examine couples' perceptions of each other's emotion (e.g., Gadassi, Mor, & Rafaeli, 2011; Howland, 2015; Howland & Rafaeli, 2010; Overall, Fletcher, Simpson, & Fillo, 2015; Sened, Yovel, Bar-Kalifa, Gadassi, & Rafaeli, 2017; Wilhelm & Perrez, 2004). For example, Howland and Rafaeli (2010) had 37 married and dating couples complete electronic diaries of their own and their partner's feelings (e.g., angry, sad, uneasy, cheerful) for three weeks. Similar to the findings from some lab-based studies, empathic accuracy was greater for negative moods as compared to positive moods; assumed similarity perceptions, however, were not assessed. Assessing both empathic accuracy and assumed similarity, Wilhelm and Perrez (2004) asked couples to rate their own and their partner's physical and emotional state during times when they were apart six times a day for one week. They found significant empathic accuracy and assumed similarity in ratings of partners' emotional state; however, this study did not differentiate between perceptions of positive versus negative emotions. Focusing on negative affect among couples (composite of anger, anxiety and sadness), Sened, Yovel, et al. (2017) found that men and woman showed both empathic accuracy and assumed similarity in rating their partners' negative affect across three independent samples. Further, they also found evidence of

indirect accuracy whereby couples' daily negative affect was positively correlated, and therefore, assuming similarity in their affect lead to accurately perceiving their partners' emotions.

A limitation of prior diary studies on emotions is that often empathic accuracy is assessed, but assumed similarity or tests of indirect accuracy are neglected; this may lead to inflated estimates of empathic accuracy of emotions. A second limitation is that positive and negative emotions are often grouped together to create an emotion composite, or studies focus only on negative emotions. Given positive emotions are related to pro-relationship behavior, signaling greater commitment and intimacy (Shiota et al., 2004) whereas negative emotions are related to worse communication and negative behavior (Tashiro & Frazier, 2007), distinguishing couples' perceptions of different emotions is warranted (Lemay, Overall, & Clark, 2012). The present study addresses these limitations by assessing empathic accuracy, assumed similarity, and indirect accuracy of couples' positive and negative daily affect.

Present Study

The present study examined couples' perceptions of each other's emotions in daily life, and extends previous research in several ways. First, previous research has primarily assessed perceptions of emotion during laboratory-based marital interaction tasks, which has provided information on between-person estimates of empathic accuracy and assumed similarity during relationship-relevant and emotionally-eliciting interactions. Building on this work, we utilized daily dairies to assess couples' perceptions in the ecologically-valid context of daily life. The use of daily diary data also allows us to capture *within-person* estimates of couples' perceptions. Understanding empathic accuracy and assumed similarity at the within-person level has practical and clinical importance because previously obtained between-person estimates do not necessarily generalize to within-person or within-couple phenomena (Bolger & Laurenceau, 2013; Hoffman, 2015). We used the APIM framework to simultaneously test husbands' and wives' empathic accuracy and assumed similarity in rating their partner's positive and negative affect each day, thereby addressing concerns that empathic accuracy estimates in previous studies may have been inflated. Also building on previous work, we test an indirect pathway in which congruency in emotions leads to accuracy through assumed similarity.

Based on previous research, as well as couple-based therapeutic approaches (e.g., emotion focused therapy, integrative couple therapy), we distinguished between hard and soft negative emotions (Croyle & Waltz, 2002; Greenberg & Johnson, 1988; Jacobson & Christensen, 1996; Lemay et al., 2012). Hard negative affect includes feelings such as anger, hostility, and irritation, and is associated with a desire for power within the relationship. In contrast, soft negative affect includes feelings such as sadness and fear, and conveys a sense of vulnerability within the relationship (Jacobson & Christensen, 1996; Randall & Schoebi, 2015). Another distinction is that hard negative affect is typically expressed with more overt nonverbal behavior. We controlled for daily marital satisfaction, since previous studies have shown that satisfaction is related to empathic accuracy (Cohen et al., 2012; Guthrie & Noller, 1988). We hypothesized that husbands' and wives' would use both empathic

accuracy and assumed similarity in assessing their partner's daily affect. Additionally, based on available evidence (Sened, Yoval, et al., 2017), we hypothesized that there would be significant indirect accuracy in husbands' and wives' perceptions of their partner's daily affect.

Method

Participants

Participants were 55 heterosexual couples, recruited to participate in a larger study about family relationships and mental health conducted in 2014–2015. Couples were recruited from the community through letters sent to homes of families in local school districts with a child between the ages of 10 to 16, and flyers posted in the community. Based on the larger study goals, primary inclusion criteria for participation were that couples had been living together for at least two years and had a child in the target age range who lived with them the majority of the time (Child M age = 13.50, SD = 1.80; 52.7% girls). On average, couples lived together for 14.77 years (SD = 8.41, range = 2.33 to 36.21). Approximately 86% of couples were married (M = 14.93 years, SD = 8.57); the terms “husbands”, “wives”, and “spouses” were used in the present study for brevity. Husbands' and wives' mean ages were 42.31 (SD = 8.11) and 40.15 (SD = 7.33) years, respectively. Thirty-eight percent of husbands and 40% of wives had at least a 4-year college degree. The median yearly household income was between US\$50,001 and US\$60,000. The sample was ethnically diverse: 36.4% of husbands and 30.9% of wives were African American, 30.9% of husbands and 34.5% of wives were European American, 21.8% of husbands and 25.5% of wives were Hispanic; 6 husbands and 5 wives selected more than one race or reported their race as “Other”. The present study is based on the 51 couples in which both partners completed the daily diary phase of the study.

Procedure

During a laboratory visit, couples completed questionnaires about themselves and their family. Beginning the following week, couples completed daily diaries each evening for 7 consecutive nights. The study procedure was approved by the university's institutional review board, and husbands and wives provided informed consent. Measures relevant to the present study are described below. Families received \$140 for their participation in the lab visit, and each spouse received up to \$10 for completing their diaries (\$1/day plus \$3 bonus for completing all diaries).

Measures

Daily affect.—During the designated 7 days, spouses completed a brief electronic diary each evening, using the Qualtrics web-based survey software. Diaries were delivered via text or email based on participants' preference. A paper copy option was offered to couples; however, no couple requested paper diaries. Participants were asked to complete the diary before going to bed, and to not discuss their answers with their partner. The instructions for reporting one's own affect were, “*Below is a list of words and phrases that describe different feelings and emotions. Please indicate to what extent you felt this way today (thinking about your day overall, from the time you woke up).*” To rate partner affect, the second half of the

instructions were revised to “*Please indicate to what extent you think your partner felt this way today (thinking about his/her day overall, from the time s/he woke up)*”. Participants rated 8 items on a 5-point Likert scale, where 1 = *Very Slightly or Not at All* and 5 = *Extremely*. The items were taken from the *Positive and Negative Affect Schedule-Expanded Form* (PANAS-X; Watson & Clark, 1994), which was created to measure specific emotional states. We used the items from the joviality subscale of the General Positive Emotion Scale and the items from the fear, sadness, and hostility subscales of the General Negative Emotional Scale. These items were grouped so that each emotional state was represented by two questions, for a total of 8 affect items. For example, the 6 fear items were combined to create 2 items of “Afraid, scared, or frightened” and “Nervous, jittery, shaky.” The PANAS-X has excellent psychometric properties (Watson & Clark, 1994). Furthermore, when participants are given short-term time instructions (i.e., “think about your day today”), the PANAS-X can capture daily variation in affect (Watson & Clark, 1994).

We followed guidelines by Cranford et al. (2006) to examine between- (R_{IF}) and within- (R_C) person reliability of the affect scales (see Table 1). Both reliabilities were acceptable for measuring Positive Affect (2 items; sum of joviality items) and Soft Negative Affect (4 items; sum of fear and sadness items); however, R_{IF} for the Hard Negative Affect scale was poor (2 items; R_{IF} ranged from .35-.61). Therefore, hard negative affect was assessed with 1-item (“Angry, hostile, or irritable”); we selected this item because there was greater variability in responses to this item as compared to “Scornful, disgusted, or loathing”.

Daily marital satisfaction.—Each night, husbands and wives completed the 4-item *Couples Satisfaction Index* (Funk & Rogge, 2007). For each item, participants were asked to think about their day, overall, from the time they woke up. A sample item was “Please indicate the degree of happiness, all things considered, of your relationship today” rated on a 7-point scale from *extremely unhappy* to *perfect*. Using the cut-off score of 13.4 (Funk & Rogge, 2007), approximately 33–47% of wives and 42–50% of husbands reported being unsatisfied in their relationship that day. The 4-item CSI had excellent between-person (husband $R_{IF} = 0.90$; wife $R_{IF} = 0.95$) and within-person (husband $R_C = 0.89$; wife $R_C = 0.91$) reliability.

Analysis Plan

We used West and Kenny’s (2011) truth and bias model, which is based on the Actor-Partner Interdependence Model (APIM; Cook & Kenny, 2005). This dyadic data analytic approach simultaneously estimates each partners’ empathic accuracy and assumed similarity. The APIM is widely used to examine partners’ perceptions of each other’s thoughts and feelings (e.g., Simpson et al., 2003; Overall et al., 2015; Papp et al., 2010). These models were run as two-level multivariate hierarchical linear models, using the HLM v. 7 software and adapted to be consistent with guidelines for analyzing dyadic diary data (Bolger & Laurenceau, 2013). A sample Level 1 model assessing empathic accuracy and assumed similarity of positive affect is presented:

$$\begin{aligned} \text{Perception of Partner's Positive Affect} = & \text{Husband} [\beta_{0H} + \beta_{1H}(\text{time}) + \beta_{2H}(\text{husband marital satisfaction}) \\ & + \beta_{3H}(\text{wife positive affect}) + \beta_{4H}(\text{husband positive affect})] + \text{Wife} [\beta_{0W} + \beta_{1W}(\text{time}) \\ & + \beta_{2W}(\text{wife marital satisfaction}) + \beta_{3W}(\text{husband positive affect}) + \beta_{4W}(\text{wife positive affect})] + R \end{aligned}$$

In multivariate HLM, a separate model is simultaneously estimated for husbands and wives. In this model, the outcome is perception of one's partner's positive affect, which has been centered on their partners' average self-rating. Thus, the intercepts in this model, β_{0H} and β_{0W} , represent *directional bias*. For example, a positive coefficient for β_{0H} would indicate that, on average, husbands overestimate their wives' positive affect and a negative coefficient would indicate that, on average, husbands underestimate their wives' positive affect.

Following centering guidelines for estimating within-person relations and separating out confounding between-person effects (Bolger & Laurenceau, 2013), husbands' and wives' self-reported positive affect were person-centered at Level 1, and each person's average level was included (grand-mean centered) as a covariate of the intercepts at Level 2. Thus, the parameters β_{3H} and β_{3W} represent within-person estimates of empathic accuracy (also referred to as tracking accuracy or direct accuracy in the truth and bias model). That is, husbands' and wives' ratings of their partner's positive affect are regressed onto their partners' self-reported positive affect that day. The parameters β_{4H} and β_{4W} provide within-person estimates of assumed similarity; that is, husbands' and wives' ratings of their partner's positive affect are regressed onto their own self-reported positive affect that day. In models in which hard negative or soft negative affect was the dependent variable, we controlled for the other negative affect variable at Level 1. Also included as predictors in the model at Level 1 were duration of time (i.e., diary day), which was centered at the mid-point of the week¹, and daily marital satisfaction, which was grand-mean centered. Because daily marital satisfaction was a covariate in the model, we did not partition it into its between- and within-person effects, consistent with Bolger and Laurenceau's (2013) recommendation.

The Level 2 model aggregates the within-person estimates of directional bias, empathic accuracy, and assumed similarity to provide parameter estimates for the sample. The corresponding Level 2 model is:

$$\beta_{0H} = \gamma_{00H} + \gamma_{01H}(\text{mean wife positive affect}) + \gamma_{02H}(\text{mean husband positive affect}) + U_{0H}$$

$$\beta_{1H} = \gamma_{10H}$$

$$\beta_{2H} = \gamma_{20H}$$

¹Models were run including a dummy code for whether it was a weekend (Fri-Sun) or weekday (Mon-Thurs); however, perceptions of partners' emotions did not significantly differ based on this variable. Thus, only time (i.e., diary day) was included in the final models.

$$\beta_{3H} = \gamma_{30H} + U_{3H}$$

$$\beta_{4H} = \gamma_{40H} + U_{4H}$$

$$\beta_{0W} = \gamma_{00W} + \gamma_{01W}(\text{mean husband positive affect}) + \gamma_{02W}(\text{mean wife positive affect}) + U_{0W}$$

$$\beta_{1W} = \gamma_{10W}$$

$$\beta_{2W} = \gamma_{20W}$$

$$\beta_{3W} = \gamma_{30W} + U_{3W}$$

$$\beta_{4W} = \gamma_{40W} + U_{4W}$$

where γ_{30H} and γ_{30W} are the average empathic accuracy estimates for husbands and wives, respectively, and γ_{40H} and γ_{40W} are the average assumed similarity estimates for husbands and wives, respectively, for the sample. Post-hoc analyses examining sex differences were tested to aid in the interpretation of results; however, no specific hypotheses were posited. Given our sample size, the fixed effects without robust standard errors are reported in all models.

Next, we tested for indirect accuracy, or the extent to which spouses were accurate in perceiving their partner's affect by being biased (e.g., Sened, Yovel, et al., 2017; West & Kenny, 2011). That is, we tested the significance of an indirect pathway in which congruency in couples' daily affect (also referred to as real or actual similarity) predicted perceptions of one's partner's affect via assumed similarity. To test for indirect accuracy, we ran a model to estimate congruency in husbands' and wives' affect; a multivariate HLM, such as the model above, was run in which self-reported affect was predicted by one's partner's self-reported affect, controlling for time and daily marital satisfaction. This estimate was the "a path" of the indirect model. Next, the assumed similarity estimates from the main APIM models were used for the "b path" of the model. Indirect accuracy is represented by the a*b pathway. The significance of this indirect pathway was tested by bootstrapping a 95% confidence interval of the indirect effect through a Monte Carlo simulation with 20,000 repetitions (MacKinnon, Lockwood, & Williams, 2004). A confidence interval that does not include zero indicates a significant indirect effect.

Results

Fifty-two husbands (94.5%) completed diaries, providing 324 observations. On average, husbands completed 6.23 days of diaries ($SD = 1.46$, range 2–7); 71.2% completed all 7 days. One husband was excluded from analyses given his wife did not complete any diaries. The 51 wives who completed diaries (92.7%) provided 333 reports. On average, wives completed 6.53 days of diaries ($SD = 1.19$; range 2–7); 82.4% completed all 7 days. HLM uses maximum likelihood estimation to handle missing data at Level 1 (i.e., missing diary data), which is a robust and powerful missing data approach that has been shown to produce unbiased parameter estimates (Enders, 2010).

Table 1 provides descriptive information for the daily affect scores averaged across the 7 days. There was no significant difference between husbands and wives on any of the study variables, when averaged across the 7 days. Overall, both husbands and wives self-reported more positive affect, as compared to hard or soft negative affect. Table 1 also provides the intraclass correlation (ICC) for the diary data; the ICC indicates the proportion of variance between people. For example, the ICC of .39 for husbands' self-rated positive affect indicates that 39% of the variability in positive affect during the week was between husbands, and 61% of the variability was within-person for husbands. There was more within-person variability in self-reported and partner-reported affect. The ICCs in the present study are within range of the ICC typically reported in diary studies (0.2–0.4; Bolger & Laurenceau, 2013).

Perception of Positive Daily Affect

Empathic accuracy and assumed similarity.—Parameter estimates from the APIM model predicting perceptions of partner's positive affect, controlling for time and daily marital satisfaction, are presented in Table 2. Husbands' showed significant empathic accuracy, $b = 0.29$, $SE = 0.06$, $p < .001$, $pseudo-B = 0.34$, and assumed similarity, $b = 0.40$, $SE = 0.06$, $p < .001$, $pseudo-B = 0.54$, when rating their wives' overall positive affect that day. Similarly, wives' empathic accuracy, $b = 0.18$, $SE = 0.05$, $p < .001$, $pseudo-B = 0.25$, and assumed similarity, $b = 0.28$, $SE = 0.08$, $p < .001$, $pseudo-B = 0.33$, were significant in rating their husbands' positive affect that day. Post-hoc hypothesis testing in HLM found that husbands and wives did not significantly differ in their levels of empathic accuracy, $\chi^2(1) = 1.90$, $p = .16$, or assumed similarity, $\chi^2(1) = 1.38$, $p = .24$. Additionally, husbands' directional bias was significant, indicating that husbands, on average, underestimated their wives' positive affect, $b = -0.30$, $SE = .12$, $p = .02$, $pseudo-B = 0.50$.

Congruency in daily positive affect.—Controlling for time and wives' daily marital satisfaction, wives' self-reported positive affect was significantly related to her husbands' self-reported positive affect, $b = 0.18$, $SE = 0.06$, $p = .006$, $pseudo-B = 0.21$, suggesting congruency in wives' and husbands' positive affect. Husbands' positive affect, however, was not significantly predicted by his wives' positive affect, after controlling for time and husbands' marital satisfaction, $b = 0.16$, $SE = 0.09$, $p = .06$, $pseudo-B = 0.17$.

Indirect accuracy.—Significant indirect accuracy was found for wives, 95% CI of indirect effect [0.013, 0.100], suggesting that, for wives, assuming similarity lead to accuracy in

perceiving their husbands' positive affect. For husbands, the indirect accuracy effect was not significant, 95% CI [-0.001, 0.142].

Perception of Hard Negative Daily Affect

Empathic accuracy and assumed similarity.—The APIM testing spouses' perceptions of their partner's hard negative affect, controlling for both spouses' self-reported soft negative affect, time, and daily marital satisfaction indicated significant effects only for assumed similarity for both husbands, $b = 0.24$, $SE = 0.08$, $p = .003$, $pseudo-B = 0.32$, and wives, $b = 0.31$, $SE = 0.08$, $p < .001$, $pseudo-B = 0.42$ (Table 3). Husbands and wives did not significantly differ in their level of assumed similarity, $\chi^2(1) = 0.43$, $p = .51$.

Congruency in daily hard negative affect.—Controlling for time and self-reported daily marital satisfaction, both husbands', $b = 0.21$, $SE = 0.06$, $p = .001$, $pseudo-B = 0.22$, and wives', $b = 0.29$, $SE = 0.08$, $p < .001$, $pseudo-B = 0.29$, self-reported hard negative affect was positively related to their partners' hard negative affect that day, suggesting congruency within couples in feelings of anger, hostility, and irritability.

Indirect accuracy.—Indirect accuracy was significant for both husbands, 95% CI [0.014, 0.10], and wives, 95% CI [0.034, 0.162], suggesting that although spouses are not empathically accurate in perceiving their partners' hard negative affect, they are still indirectly accurate in rating their partner's by being biased (i.e., by assuming similarity).

Perception of Soft Negative Daily Affect

Empathic accuracy and assumed similarity.—The APIM testing spouses' perceptions of their partner's soft negative affect, controlling for both spouses' self-reported hard negative affect, time, and daily marital satisfaction indicated significant effects only for assumed similarity for both husbands, $b = 0.21$, $SE = 0.09$, $p = .01$, $pseudo-R^2 = 0.06$, and wives, $b = 0.28$, $SE = 0.09$, $p = .002$, $pseudo-R^2 = 0.15$ (Table 4). Husbands and wives did not significantly differ in their level of assumed similarity, $\chi^2(1) = 0.20$, $p = .65$.

Congruency in daily soft negative affect.—Controlling for time and self-reported daily marital satisfaction, neither husbands', $b = 0.03$, $SE = 0.06$, $p = .63$, $pseudo-B = 0.03$, nor wives', $b = 0.19$, $SE = 0.11$, $p = .09$, $pseudo-B = 0.17$, self-reported soft negative affect was related to their partners' soft negative affect that day. Therefore, we did not find evidence that couples were congruent in their daily experiences of sadness and fear.

Indirect accuracy.—The indirect effect for indirect accuracy was not significant for either husbands, 95% CI [-0.021, 0.038], or wives, 95% CI [-0.006, 0.133].

Post-hoc analyses: Contextual effects.—To provide more cogent conclusions about the extent to which within-person fluctuations in daily affect (rather than general knowledge of one's partner's typical affect) are related to husbands' and wives' daily perceptions of each other, we re-ran models to obtain contextual effects, also referred to as incremental between-person effects (Hoffman, 2015). Two adjustments were made to the APIM models presented earlier: the Level 1 predictors were entered grand-mean centered and the

dependent variables were entered uncentered. When the model is run this way, the parameters γ_{01H} , γ_{02H} , γ_{01W} , and γ_{02W} above no longer present between-person relations, but rather the incremental between-person effects. For example, γ_{01H} tests the extent to which wives' average positive affect has an *additional* effect on husbands' perceptions of their wives' affect, over and above wives' positive affect *that day*.

Results for these contextual effects are presented at the bottom of Tables 2 and 3. Across all models, partners' average affect did not predict additional variance in spouses' perceptions of each other over and above the partner's affect that day. However, two cross-partner relations were observed in which one's own average affect predicted daily ratings of the partner's affect, over and above the partner's affect that day. Specifically, wives' average positive affect positively predicted their rating of their husbands' daily positive affect, over and above their husband's positive affect that day, $b = 0.26$, $SE = 0.10$, $p = .01$. Also, husbands' average soft negative affect positively predicted their rating of their wives' daily soft negative affect, over and above their wife's daily soft negative affect, $b = 0.42$, $SE = 0.15$, $p = .006$.

Correction for Multiple Tests

We used the Benjamini-Hochberg's false discovery rate correction (Benjamini & Hochberg, 1995) to maintaining alpha at .05, given three tests each were run for empathic accuracy, assumed similarity, and directional bias across the three emotions types. All significant main effects for empathic accuracy and assumed similarity remained significant. The directional bias result of husbands' underestimating their wives' positive affect, however, was no longer significant ($p = .06$).

Discussion

The present study assessed couples' empathic accuracy and assumed similarity in rating their partner's overall daily affect. Whereas studies of empathic accuracy have typically been conducted in controlled, laboratory settings and in the context of a marital conflict interaction, we used a daily diary methodology to examine how emotionally attuned couples are to each other in daily life. Extending previous research in this area, we simultaneously assessed empathic accuracy and assumed similarity perceptions, and measured both positive and negative emotions. We also tested for indirect accuracy, in which assumed similarity can lead to accuracy because there is congruency in couples' affect. Several important findings emerged. First, overall, husbands' and wives' reported more positive than negative affect in daily life, which is consistent with Campos et al. (2013) who also found that the daily affect of couples with children is more positive than negative. Husbands and wives were both empathically accurate and assumed similarity in rating their partner's overall positive affect that day. In addition, there was congruency in husbands' and wives' positive affect, which for wives lead to indirect accuracy in rating her husbands' positive affect.

Second, we did not find evidence of empathic accuracy in assessing soft negative emotions of sadness and fear or assessing hard negative affect; rather husbands' and wives' perceptions were based on how they felt during the day—i.e., assumed similarity. Of importance, assumed similarity does not imply that spouses are inaccurate or make an error

in perceiving their partners' feelings (West & Kenny, 2011). Assumed similarity, and bias in general, simply implies that one's perceptions are based on information other than their partner's actual feelings (i.e., the truth force; West & Kenny, 2011). In the case of hard negative affect, we found evidence for indirect accuracy, in which husbands' and wives' were accurate in perceiving their partner's affect because they were biased. That is, husbands' and wives' showed congruency in their feelings of anger, hostility, and irritation during the day, and therefore, assuming similarity—rather than being empathically attuned to their partner—lead to accuracy in perceiving their partner's hard negative affect. Thus, the present study found evidence for differences in couples' perceptions of hard vs soft negative affect. Misjudging your partner's negative emotions—particularly soft negative emotions which may signal vulnerability—can have problematic implications for relationships. Understanding your partners' emotions is a necessary first step toward providing appropriate social support (Verhofstadt, Ickes, & Buysee, 2010). Not responding to your partner during times when they are feeling sad, lonely, or afraid could exacerbate these feelings; intensified feelings of sadness, in turn, can spill over to affect the quality of the relationship (Kouros, Papp, & Cummings, 2008).

Third, we did not find evidence that knowing your partners' typical mood predicts your perception of how they are feeling over and above their emotion that day (i.e., contextual effects). Thus, the findings suggest that husbands' and wives' perception of each other are indeed related to fluctuations in their spouses' daily affect. This finding also underscores the importance of moving beyond cross-sectional, laboratory-based studies and examining couples' perceptions of emotions in daily life.

Few studies have assessed couples' perceptions of each other's emotions in daily life; however the findings are partially consistent with Wilhelm and Perez (2004) who reported that spouses were both empathically accurate and biased in rating how their partner felt during times when they were apart. In contrast to Sened and colleagues (2017) who found significant empathic accuracy and assumed similarity for negative emotions, as well as significant indirect accuracy, we did not find evidence that spouses were empathically accurate of negative target emotions. Rather, we found that wives were empathically and indirectly accurate in rating their husbands' positive affect, and husbands and wives were indirectly accurate in rating their partner's hard, but not soft, negative affect. However, the couples in Sened and colleagues' studies were, on average, younger and together for 4.6–5 years, and research has found that empathic accuracy decreases and assumed similarity increases the longer couples are together (Kilpatrick et al., 2002; Thomas et al., 1997). Overall, the findings underscore the importance of differentiating between positive, hard negative, and soft negative emotions in order to understand perceptions of partner's emotions in daily life. Moreover, these results held controlling for daily marital satisfaction, suggesting that our operationalization of empathic accuracy and assumed similarity were not simply tapping into the quality of couples' relationships.

Of note, we did not find evidence for gender differences in the strength of empathic accuracy or assumed similarity effects between husbands and wives. Gender differences in the literature have been largely mixed (Gagné & Lydon, 2004), and some researchers have suggested that men may be more accurate in perceiving their partner's emotions because

women are more expressive of their emotions (e.g., Campos et al., 2013; Noller, 1992). Conversely, Kenny and Acitelli (2001) proposed that woman's empathic accuracy may be lower because men don't express their emotions well.

There are several limitations to the present study that merit consideration and provide future research directions. First, our sample size was relatively small; however, it was not atypical compared to other daily diary studies (e.g., Gadassi et al., 2011; Howland & Rafaeli, 2010; Sened, Yovel, et al., 2017), and notably was more ethnically diverse as compared to previous research in this area. Further, simulations studies have shown that sample sizes with a minimum of 50 level 2 units (i.e., 50 couples) result in unbiased regression coefficients, standard errors, and variance components (Maas & Hox, 2005) and Hoyle and Gottfredson (2015) recently reported that when fixed effects are the parameters of interest (as is the case in our study), results based on as low as 30 level 1 units can be trusted. As a comparison, we had 324 and 333 units of complete level 1 data for husbands and wives, respectively.

Second, we did not assess how much of the day partners were in contact with each other, which may affect their perceptions of each other's emotions (e.g., Wilhelm & Perez, 2004). However, in preliminary models, we did not find that empathic accuracy or assumed similarity perceptions differed on weekday versus weekend days. A future research direction is to examine how the amount and type of contact (e.g., face-to-face, phone, texting) can alter couples' perceptions of each other's daily affect. Third, participants reported on how they felt, overall, during the day, and we did not assess whether their affect was relational (elicited by or directed toward their partner) or non-relational (affective feelings not related to the relationship). Nonetheless, Koerner and Fitzpatrick (2002) found that the ability to perceive nonrelational negative affect uniquely predicted one's own marital satisfaction. Additionally, emotions outside the context of the relationship (e.g., negative affect elicited by work) can spillover to negatively affect home life (e.g., Judge & Ilies, 2004). Thus, perceiving your partner's emotions during the day, even if not elicited by or directed toward your partner, is important for understanding the processes underlying healthy relationship functioning. Fourth, to measure daily affect, we modified the *PANAS-X* by combining items (e.g., alone and lonely) in order to reduce the number of total items and shorten the time it took participants to complete their nightly diaries. In the case of hard negative affect, our composite was not reliable and we had to use a 1-item measure. Short-item questionnaires, and single-item measures, however, are common in diary studies, and are necessary for preventing participant burden and attrition (Cranford et al., 2006). Fifth, our sample included couples in longer-term relationships with adolescent children; therefore, the results may not generalize to newlyweds or couples without children.

The present study extends our understanding of emotions in the relationship context, by examining how partners perceive each other's emotions in daily life. Empathic accuracy of emotions, including mirroring and validating your partner's feelings, are implicated in healthy relationship functioning; however, it is also important to understand the mechanisms linking empathic accuracy to these positive outcomes in the context of daily life. Moreover, empathic effort—the perception that your partner is trying to understand you—may be more strongly linked to relationship outcomes than accuracy (Cohen et al., 2012). Assumed similarity in values, personality attributes, and daily feelings has also been linked to greater

marital satisfaction (Cheng & Grühn, 2015). However, given misjudging your partner's emotions is linked to negative relationship outcomes, future research should examine under what conditions assumed similarity is helpful versus harmful to the relationship. For example, the benefits of assumed similarity may be only short-lived, or beneficial only for the perceiver. The findings also have clinical implications. A common approach of couples-based therapies is increasing emotional awareness and understanding, and in particular eliciting emotions of sadness and fear that may underlie expressions of anger (Benson, McGinn, & Christensen, 2012). However, the present findings show differences in perceptions of soft vs. hard negative affect that would need to be addressed in tandem with encouraging expression of soft negative emotions. In particular, the findings from our study show that increasing accuracy of soft negative emotions (either empathic or indirect accuracy) may require different strategies in contrast to hard negative emotions. Moreover, whereas previous research has primarily focused on between-person estimates of couples' perceptions of each other's thoughts and feelings, between-person estimates do not necessarily generalize to the within-person level; therefore, the results of the current study may be more relevant to clinicians working with couples. Complementing laboratory studies, the present study underscores that examining couples' perceptions of each other's feelings in contexts of daily life can further our understanding of the role of emotions for positive relationship functioning.

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Table 1

Descriptive Information on Study Variables Averaged across Diary Days

	Husbands						Wives					
	R _{IF}	R _C	ICC	M	SD	Range	R _{IF}	R _C	ICC	M	SD	Range
Self-reported Positive Affect	0.69	0.76	.38	3.27	0.68	1.71–4.86	0.74	0.72	.39	3.34	0.68	2.17–5.00
Self-reported Hard Negative Affect ^a	--	--	.22	1.46	0.49	1.00–3.29	--	--	.20	1.48	0.47	1.00–2.50
Self-reported Soft Negative Affect	0.58	0.55	.26	1.22	0.30	1.00–2.25	0.67	0.69	.43	1.28	0.36	1.00–2.82
Rating of Partner Positive Affect	0.66	0.73	.40	3.16	0.69	1.50–5.00	0.76	0.66	.47	3.17	0.75	1.67–4.71
Rating of Partner Hard Negative Affect ^a	--	--	.17	1.41	0.40	1.00–2.29	--	--	.32	1.48	0.52	1.00–2.67
Rating of Partner Soft Negative Affect	0.60	0.66	.38	1.29	0.35	1.00–2.79	0.72	0.67	.38	1.20	0.34	1.00–2.68
<u>Covariate</u>												
Marital Satisfaction	0.90	0.89	0.66	14.00	3.41	4.86–20.17	0.95	0.91	0.50	14.05	4.25	2.50–20.57

Note. $N = 51$ couples. Means and *SD* calculated for daily affect scores and marital satisfaction averaged across the 7 days for descriptive purposes. R_{IF} = between-person reliability (internal consistency of measure for a single, fixed-day) and R_C = within-person reliability (reliability for detecting within-person change across diary days; Cranford et al., 2006). ICC = intraclass correlation, indicating the proportion of between-person variability in daily affect.

^aHard negative affect measured with 1-item; thus, not R_{IF} or R_C reported.

Table 2

Empathetic Accuracy and Assumed Similarity of Partner's Positive Daily Affect

	Husband Perception of Wife			Wife Perception of Husband		
	Fixed Effects					
<i>Level 1</i> (Within-person)	<i>b</i> (<i>SE</i>)	<i>B^a</i>	<i>95% CI for b</i>	<i>b</i> (<i>SE</i>)	<i>B^a</i>	<i>95% CI for b</i>
Intercept (Directional Bias) ^R	−0.30 (0.12) *	0.50	[−0.54, −0.06]	−0.04 (0.12)	0.06	[−0.27, 0.19]
Time Slope ^b	0.01 (0.02)	0.05	[−0.02, 0.05]	0.02 (0.02)	0.09	[−0.01, 0.06]
Daily Marital Satisfaction	0.05 (0.01) ***	0.43	[0.03, 0.07]	0.04 (0.01) ***	0.36	[0.02, 0.06]
Empathic Accuracy ^R	0.29 (0.06) ***	0.34	[0.16, 0.42]	0.18 (0.05) ***	0.25	[0.08, 0.28]
Assumed Similarity ^R	0.40 (0.06) ***	0.54	[0.28, 0.53]	0.28 (0.08) ***	0.33	[0.13, 0.43]
<i>Level 2</i> (Between-person)						
Intercept						
Mean Self-reported Affect	0.47 (0.11) ***	0.96	[0.26, 0.69]	0.60 (0.10) ***	1.69	[0.40, 0.79]
Mean Partner-reported Affect	−0.71 (0.10) ***	1.44	[−0.92, −0.50]	−0.67 (0.09) ***	1.90	[−0.84, −0.49]
Post-hoc Model ^c						
<i>Level 2</i> (Contextual Effect/Incremental Between-person Effect)						
Intercept						
Mean Self-reported Affect	0.07 (0.12)	--	[−0.17, 0.30]	0.26 (0.10) *	--	[0.06, 0.47]
Mean Partner-reported Affect	0.03 (0.11)	--	[−0.20, 0.25]	0.11 (0.10)	--	[−0.09, 0.31]

Note. *N* = 51 couples. Unstandardized coefficients and standard errors from model without robust standard errors reported. ^RRandom effect estimated.

^aPseudo-standardized coefficients (Hoffman, 2015, p. 342).

^bTime coded as −3 to 3 to represent diary reporting day, centered at the midpoint of the reporting week.

^cPost-hoc model to obtain contextual effects were run by grand-mean centering the level 1 predictors and including the dependent variable in model uncentered. Within-person effects remain the same. Pseudo-standardized coefficients not appropriate when using grand-mean centered at Level 1 and, therefore, not calculated.

[†]*p* < .10,

* *p* < .05,

*** *p* < .01,

100%

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Table 3

Empathetic Accuracy and Assumed Similarity of Partner's Hard Negative Daily Affect

	Husband Perception of Wife		Wife Perception of Husband	
	Fixed Effects			
<i>Level 1</i>	<i>b</i> (<i>SE</i>)	<i>B^a</i>	<i>b</i> (<i>SE</i>)	<i>B^a</i>
Intercept (Directional Bias) ^R	-0.14 (0.12)	0.24	0.16 (0.12)	0.28
Time Slope ^b	-0.06 (0.02)***	0.26	-0.02 (0.02)	0.08
Daily Marital Satisfaction	-0.02 (0.01) [†]	0.15	-0.02 (0.01)**	0.24
Husband Soft Negative Affect	0.21 (0.11)*	0.13	0.03 (0.11)	0.02
Wife Soft Negative Affect	0.17 (0.10) [†]	0.13	0.34 (0.10)***	0.25
Empathic Accuracy ^R	0.12 (0.06) [†]	0.17	0.10 (0.07)	0.13
Assumed Similarity ^R	0.24 (0.08)**	0.32	0.31 (0.08)***	0.42
<i>Level 2</i>				
Intercept				
Mean Self-reported Affect	0.14 (0.13)	0.14	0.50 (0.16)**	0.44
Mean Partner-reported Affect	-0.60 (0.15)***	0.55	-0.12 (0.14)	0.11
Post-hoc Model ^c				
<i>Level 2</i> (Contextual Effect/Incremental Between-person Effect)				
Intercept				
Mean Self-reported Affect	0.03 (0.11)	--	0.16 (0.13)	--
Mean Partner-reported Affect	-0.05 (0.11)	--	0.05 (0.12)	--

^a Note. *N* = 51 couples. Unstandardized coefficients and standard errors from model without robust standard errors reported. ^R Random effect estimated. Pseudo-standardized coefficients (Hoffman, 2015, p. 342).

^b Time coded as -3 to 3 to represent diary reporting day, centered at the midpoint of the reporting week.

^c Post-hoc model to obtain contextual effects were run by grand-mean centering the level 1 predictors and including the dependent variables in model uncentered. Within-person effects remain the same. Pseudo-standardized coefficients not appropriate when using grand-mean centered at Level 1 and, therefore, not calculated.

[†] *p* < .10.

$d < .001$

 $p < .01$
**
 $p < .05$
*

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Table 4

Empathetic Accuracy and Assumed Similarity of Partner's Soft Negative Daily Affect

	Husband Perception of Wife		Wife Perception of Husband	
	Fixed Effects			
Level 1	<i>b</i> (<i>SE</i>)	<i>B</i> ^a	95% <i>CI</i> for <i>b</i>	95% <i>CI</i> for <i>b</i>
Intercept (Directional Bias) ^R	−0.02 (0.07)	0.04	[−0.16, 0.12]	0.06 [−0.09, 0.17]
Time Slope ^b	−0.03 (0.01) **	0.17	[−0.04, −0.01]	0.12 [−0.04, 0.001] [†]
Daily Marital Satisfaction	−0.01 (0.01) [†]	0.15	[−0.02, 0.001]	0.26 [−0.03, −0.01] **
Husband Hard Negative Affect	0.08 (0.03) *	0.17	[0.02, 0.14]	0.04 [−0.04, 0.07]
Wife Hard Negative Affect	0.04 (0.03)	0.10	[−0.02, 0.11]	0.18 [0.02, 0.15] *
Empathic Accuracy ^R	0.16 (0.13)	0.20	[−0.09, 0.41]	0.03 [−0.10, 0.16]
Assumed Similarity ^R	0.22 (0.09) *	0.22	[0.04, 0.40]	0.34 [0.10, 0.45] **
Level 2				
Intercept				
Mean Self-reported Affect	0.73 (0.13) ***	0.88	[0.48, 0.99]	1.32 [0.45, 0.79] ***
Mean Partner-reported Affect	−1.04 (0.10) ***	1.51	[−1.24, −0.85]	1.61 [−1.12, −0.70] ***
Post-hoc Model ^c				
Level 2 (Contextual Effect/Incremental Between-person Effect)				
Intercept				
Mean Self-reported Affect	0.42 (0.15) **	--	[0.12, 0.71]	0.14 (0.08) -- [−0.03, 0.30]
Mean Partner-reported Affect	−0.17 (0.11)	--	[−0.46, 0.13]	−0.10 (0.10) -- [−0.30, 0.10]

Note. *N* = 51 couples. Unstandardized coefficients and standard errors from model without robust standard errors reported. ^RRandom effect estimated.

^aPseudo-standardized coefficients (Hoffman, 2015, p. 342).

^bTime coded as −3 to 3 to represent diary reporting day, centered at the midpoint of the reporting week.

^cPost-hoc model to obtain contextual effects were run by grand-mean centering the level 1 predictors and including the dependent variables in model uncentered. Within-person effects remain the same. Pseudo-standardized coefficients not appropriate when using grand-mean centered at Level 1 and, therefore, not calculated.

[†]*p* < .10.

$p < .001$

 $p < .01$
**
 $p < .05$
*

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