

Truth and bias in daily judgments of support receipt between romantic partners

ERAN BAR-KALIFA,^a ESHKOL RAFAELI,^{a,b} AND HARAN SENED^a

^a*Bar-Ilan University* and ^b*Barnard College, Columbia University*

Abstract

The perception that a partner is supportive, tied to beneficial relational and personal outcomes, may be shaped by reality (the partner's actual support) but is often also biased. Using T. V. West and D. A. Kenny's (2011) truth-and-bias model, the balance between truth and one bias type—the tendency to maintain perceived mutuality by projecting one's own supportiveness onto one's partner—was examined. It was hypothesized that this balance will be altered by the behavior's psychological significance and by the scope of the behavior being judged. In a 35-day diary, 80 couples reported perceived and provided emotional/practical support. Participants' judgments included less biased projection when they addressed behaviors of lower emotional significance or greater contextual specificity.

When people perceive their partners accurately, they tend to feel confident and view the partners' attitudes and behaviors as predictable (e.g., Finkenauer & Righetti, 2011); such predictability builds a sense of control and is an important aspect of relationship success (Swann, Stein-Seroussi, & Giesler, 1992). Yet successful relationships sometimes involve inaccuracy as well, with people being motivated at times to distort their perception about their relationship to make it feel safer, more rewarding, or more equitable (e.g., Ickes & Simpson, 2001). We explore these competing tendencies toward accuracy and bias in the context of one key dyadic perception, namely, the perception of one's partner's supportiveness.

Perceived social support, the perception regarding the availability of support in our

lives, has consistently been found to be associated with reduced stress and improved physical and mental health (e.g., House, Landis, & Umberson, 1988; Lakey & Cronin, 2008; Uchino, 2009). In intimate relationships, this perception has been linked to various personal and relational benefits (e.g., Katz, Monnier, Libet, Shaw, & Beach, 2000; Lindorff, 2000; Monahan & Hooker, 1995). However, the association between *perception* of support and *actual* receipt of support seems moderate at best (e.g., Haber, Cohen, Lucas, & Baltes, 2007).

One approach to studying the perceived/received discrepancy involves using dyadic reports (i.e., reports from both the putative recipients and providers) of the same behaviors, enacted or not. Studies using this approach have documented substantial perceived/received discrepancies (e.g., Abbey, Andrews, & Halman, 1995; Coriell & Cohen, 1995; Norton & Manne, 2007; Pollak et al., 2001; Vinokur & Vinokur-Kaplan, 1990).

An alternative approach takes the dyadic perspective one step further and examines both partners' repeated reports regarding the enactment of specific behaviors. These studies, which eschew the reliance on retrospective

Eran Bar-Kalifa, Psychology Department, Bar-Ilan University; Eshkol Rafaeli, Psychology Department, Bar-Ilan University and Psychology Department, Barnard College, Columbia University; Haran Sened, Psychology Department, Bar-Ilan University.

Correspondence should be addressed to Eran Bar-Kalifa, Psychology Department, Bar-Ilan University, Ramat-Gan, 5290002 Israel e-mail: eran.barkalifa@gmail.com.

self-reports, have also yielded a perceived/received discrepancy. For example, Bolger, Zuckerman, and Kessler (2000) found evidence that disagreements (which can take the form of *invisible support* or its mirror image, *phantom support*) occur in 39% of the couples' days. In another diary study (Gable, Reis, & Downey, 2003), such misperceptions accounted for a still sizable 26.5% of the cases. Notably, in both studies, overestimation (phantom support) occurred slightly more often than underestimation (invisible support), though it is unclear whether this difference was significant.

Perceived mutuality in supportive transactions

Though the magnitude of the perceived–received support discrepancy varied across studies and methodologies, all studies found it to be substantial. One possible factor responsible for this discrepancy may be individuals' tendency to overperceive mutuality with their partners. Specifically, we suggest that beyond their accurate perception of their partners' support, perceivers will have a general projection bias toward perceived supportive mutuality.

Evidence for this possibility comes from a series of studies by Lemay and his colleagues (Lemay & Clark, 2008; Lemay, Clark, & Feeney, 2007; Lemay & Neal, 2013) that focused on the origins of *perceived partner responsiveness*—the perception that one's partner is understanding, validating, and caring (cf. Reis, Clark, & Holmes, 2004). Lemay and his colleagues specifically found that people project their own (actual) responsiveness onto their (perception of their) partners', with those who are more responsive perceiving their partner as more responsive as well. This finding was interpreted as reflecting the idea that people are motivated to perceive a mutuality of care within their relationships. This perception that care is reciprocated reduces feelings of vulnerability and insecurity when they themselves are more responsive and committed than their partner; conversely, it reduces feelings of guilt when they are less responsive and committed than their partner.

When does truth (or bias) prevail?

To summarize thus far, judgments of support receipt may be influenced both by the truth (i.e., the partner's actual provision) and by a projected bias that may be driven by the desire to maintain or restore perceived mutuality. Several studies find that projection plays a role larger than truth (Debrot, Cook, Perrez, & Horn, 2012; Lemay & Clark, 2008; Lemay et al., 2007), though this role seems to be moderated by factors such as attachment security (Beck, Pietromonaco, DeVito, Powers, & Boyle, 2013) or commitment (Lemay et al., 2007). Importantly, as Lemay et al. (2007) suggest, the relative strength of projected bias and accurate tracking may depend on the behavior being judged; easily observable, unequivocal, and context-specific behaviors (e.g., giving a ride on a specific day) will be met with greater accuracy and leave less room for bias effects in contrast to emotionally significant, ambiguous, and more context-independent behaviors (i.e., behaviors that are not necessarily tied to a particular stressor, such as general expressions of caring and concern; cf. Fiske & Taylor, 1991).

A recent study by Lemay and Neal (2014), which focused specifically on supportiveness rather than the more broadly defined responsiveness (e.g., Lemay et al., 2007), found evidence for accuracy being twice as strong as bias. However, the bias they reported was the (positive) effect of the perceiver's sentiment toward the partner (i.e., the perceiver's commitment, caring, regard, and satisfaction) on the perceiver's memories of their partner's supportiveness rather than the projection of the perceiver's own supportiveness *per se*.

We are interested in testing accurate and projected judgments of concrete supportiveness. Moreover, we wish to draw upon the traditional broad distinction in the support literature between emotional support and practical support (Lazarus, 1981; Pasch, Harris, Sullivan, & Bradbury, 2004; Thoits, 1986, 2011) and to test whether the balance between accuracy and projection may differ with regard to these support types. Emotional and practical support are known to differ in their psychological significance, the former being more consequential than the latter (e.g.,

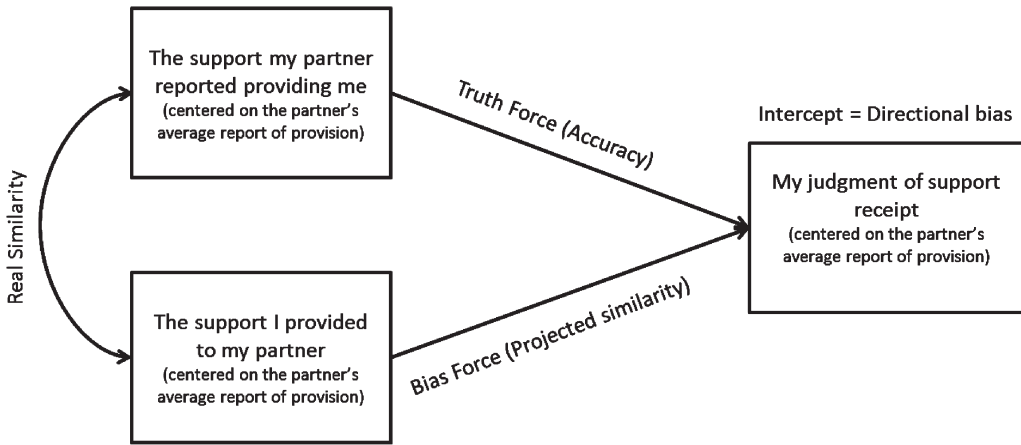


Figure 1. Applying West and Kenny's (2011) truth-and-bias model to support perception. In the models on the person level, the variables were centered on the sample grand-mean report of partners' provision.

Liu & Rook, 2013; Reinhardt, Boerner, & Horowitz, 2006; Shrout et al., 2010; Thoits, 2011; Xu & Burleson, 2004). Moreover, practical support cannot substitute for emotional support in addressing individuals' emotional needs or desires, but emotional support can be an appropriate substitute for practical support even when the latter is preferred (Cutrona, Shaffer, Wesner, & Gardner, 2007). Following Lemay et al.'s (2007) reasoning, we assume that projection will play a larger role with emotional support than with practical support as the former is often more ambiguous, context independent, and significant than the latter.

An additional factor that may alter the relative balance between truth and projected bias, yet has received no attention to date, is the scope of the behavior being judged. We expect that the truth–bias balance in aggregated or omnibus (person-level) judgments of support receipt may differ from the balance in moment-level or day-level fluctuations in judgments. The former, larger scope, aggregated judgments reflect between-subject variation. They answer the broad-stroke question: What creates a *general tendency* to report that one is supported? The latter, smaller scope, judgments reflect within-subject variation. They answer the more nuanced question: What determines one's ebb and flow or specific fluctuations in feeling supported day-to-day?

As has been amply demonstrated in the daily process literature, the answer to the broad and the nuanced questions may not be the same (Bar-Kalifa & Rafaeli, 2013; Bolger & Laurenceau, 2013). Similarly, one prominent theory of support (Lakey & Orehek, 2011) has demonstrated that its effects need to be partitioned into various factors, some related to trait (or person-level) variability (i.e., one's typical reaction to support) and others related to contextual variability (i.e., one's reaction to support that is not characteristic of one's typical response to other providers). Although the projected bias is likely to emerge for both types of questions, truth is likely to play a part only in smaller scope daily fluctuations, which involve judgments of concrete, context-specific, proximal events rather than broad tendencies (e.g., Lemay et al., 2007, Study 2).

The current study

The main question of the current study is whether and under which conditions is the perception of support driven by accuracy or by projected bias of supportive mutuality in the daily life of romantic couples. This question is explored using West and Kenny's (2011) truth-and-bias model, a novel approach that has yet to be applied to the perception of support behaviors. This conceptual model (see

Figure 1) delineates three components that influence any judgment, which are referred to as a *truth force* (in this case, the degree to which the judgment of support receipt is associated with the provider's report of support provision), a *bias force* (the degree to which the judgment is biased by the recipient's own support provision), and finally, a *directional bias* (the degree to which judgments over- or underestimate the true criteria on average).

For our purposes, the providers' reports of support are treated as the truth variable. Of course, treating these reports as absolutely veridical may be questionable as any self-reports (and particularly ones about a socially desirable behavior) may be somewhat biased. Still, using this nomenclature is consistent with the existing dyadic literature (e.g., Bolger et al., 2000; Gable et al., 2003) and with the truth-and-bias model framework.

We apply the truth-and-bias model to our dyadic data in two separate sets of analyses. The first addresses the balance between truth and bias in determining *specific fluctuations* in feeling supported on a day-to-day basis. The second addresses the broader stroke balance between truth and bias in determining the *general* (or *aggregated*) *tendency* to report that one is supported. In each set, we separately examine these balances with regard to emotional or practical support.

On the (within-person) day level, we expect both truth and bias forces to play a part. Thus, our first prediction is that individuals will be accurate in tracking the support they receive (i.e., a significant *truth force*; Hypothesis 1). However, our second prediction is that individuals will judge that they had received supportive behaviors for other reasons apart from the truth. One specific *bias force* responsible for these judgments will be perceivers' tendency to project their own support provision onto their partner's behavior, thus judging that they had received support on days in which they themselves provided support (Hypothesis 2); this tendency will lead to the perception of greater supportive mutuality, apart from reality. Our third prediction, based on Bolger et al. (2000) and Gable et al. (2003), is that on average, individuals will tend to overestimate the support

they received from their partner (a directional bias; Hypothesis 3).

Above, we noted the often-documented difference in consequences found between emotional and practical support. As a preliminary analysis, we will seek to replicate this difference in relational consequences of emotional versus practical support in our data. Based on this difference, we expect to find a different balance between the relative strengths of the truth and bias forces for emotional versus practical support. We specifically expect bias to be more influential when it comes to emotional support but not when it comes to practical support (Hypothesis 4).

As a final day-level exploratory analysis, we will examine whether the truth force, the bias force, and the directional bias are interrelated both on the between-person level and the within-dyad level. At the between-person level, this will allow us to explore questions such as whether those with a greater truth force have a weaker bias force or directional bias. At the within-dyad level, it will allow us to explore questions such as whether individuals with a greater truth force are coupled with partners who themselves have a greater truth force. Unlike our previous predictions, these analyses are exploratory.

On the (between-person) aggregated level, the judgments of support receipt are broader scope and reflect individual-level differences of recipients' general tendency to feel supported. As noted above, we expect that truth is likely to play a part only in smaller scope daily fluctuations, which involve judgments of concrete, context-specific, proximal events rather than broad tendencies; conversely, projected bias is likely to emerge in smaller as well as boarder scope judgment. We expect the bias force, and not the truth force, to predict such judgments of both emotional and practical support (Hypothesis 5). In addition, as in the within-person analyses, we predict a directional bias wherein perceivers overestimate the support they receive (Hypothesis 6).

In all analyses, we will consider the role of gender as a possible factor. In their meta-analysis of studies examining the accuracy of judgments in intimate relationships,

Fletcher and Kerr (2010) found no evidence for significant gender differences in either the truth force (or “tracking accuracy” as they refer to it) or the directional (“mean-level”) bias with regard to constructs such as support, but they did find some indication of women having greater negative directional biases. Importantly, their meta-analysis did not examine the projected bias force examined here, and we know of no other studies reporting gender differences in this force. Thus, we have no *a priori* prediction regarding such a difference.

Method

Participants

The study was conducted between June 2012 and March 2013. Both print and online flyers invited participants to a couples’ study in exchange for \$100 per couple and inclusion in a raffle for a gift worth \$200. Participants included 86 Israeli couples who have been cohabiting for a minimum of 6 months and were at least 18 years old. Six couples (7%) dropped out during the study period. Among the remaining couples, the mean age was 26.7 ($SD = 3.9$), for women and 29.3 ($SD = 4.4$) for men. All participants had completed high school, with an average of 2.5 years ($SD = 2.3$) of postsecondary education; most (61.6%) had also completed a bachelor’s degree. The average relationship duration was 4.6 years ($SD = 2.9$, range = 1–17 years). The average length of cohabitation was 3.0 years ($SD = 2.5$, range = 6 months–15 years). Fifty-six couples (70.0%) were married and 21 (26.3%) were parents.

Procedure

After agreeing to participate, a lab session (lasting approximately 1.5 hr) was conducted in which participants completed background questionnaires, were introduced to the web-based diary and instructed in its use, and received a personal password to access a secure online data collection site (www.qualtrics.com). Each evening, for 35 days, participants received a link to the diary questionnaire in their personal e-mail and were asked to complete it 1 hr before going to sleep.

Participants were asked not to discuss their responses with their partner. If participants had not answered the diary for 2 consecutive days, a research assistant contacted them and emphasized the importance of adherence. Participants completed an average of 34.8 ($SD = 0.6$, range = 32–35) diary entries.

Measures

Daily emotional and practical support receipt and provision

Each evening participants were asked to indicate the extent to which they experienced stressful events outside their relationships in the last 24 hr using a five-item measure of stressors related to physical health, interpersonal relationships (outside your romantic relationship), chores or tasks, worries or concerns, and other stressors; these were rated on a 5-point scale (0 = *no at all* to 4 = *extremely*). In 81% of the days, participants reported that they had experienced stress to some extent, but the average level of stress was quite mild ($M = 0.79$, $SD = 0.70$).

Following the stressor items, participants completed a daily support inventory (Bar-Kalifa & Rafaeli, 2013), adapted from Barrera, Sandler, and Ramsay’s Scale of Social Support (1981). They were asked to specifically indicate whether they had perceived receiving any of the eight forms of emotional support (e.g., “Told me they cared a lot about me”) and/or six forms of practical support (e.g., “Did something concrete and practical to help that was related to problem”) from their partner in response to stressors they had reported. Participants also indicated whether they had provided each of these 14 forms of support to their partner. In this study, men’s and women’s average support receipt was 2.50 ($SD = 1.80$, with 69.5% of days including some support) and 2.78 ($SD = 1.76$, with 72.3% of days including some support) for emotional support and 1.57 ($SD = 1.28$; 57.9%) and 1.75 ($SD = 1.31$; 63.1%) for practical support, respectively. Average support provision scores were 2.56 ($SD = 1.55$; 76.4%) and 2.26 ($SD = 1.53$; 72.6%) for emotional support and 1.47 ($SD = 1.04$; 62.3%) and 1.29 ($SD = 1.07$; 57.9%) for practical support, respectively.

The reliabilities for the scales were estimated using procedures outlined by Shrout and Lane (2012). These authors note that these procedures offer a useful initial estimate in the case of dichotomous items in repeated measures for which there is no currently established method of assessing reliability. In our data, the between- and within-person reliabilities were .98 and .72 for emotional support receipt, .97 and .68 for practical support receipt, .97 and .62 for emotional support provision, and .96 and .55 for practical support provision.

Daily felt closeness

To assess the differential relational significance of emotional and practical support in our sample, daily relational closeness (Gleason, Iida, Shrout, & Bolger, 2008) was obtained by averaging two items ("In the last 24 hours, to what extent was your relationship ..." "*physically close*" and "*emotionally close*"), rated on a 7-point scale ranging from *not at all* to *very much*. The between- and within-person reliabilities for this scale were .96 and .69, respectively.

Results

We used West and Kenny's (2011) truth-and-bias model to test the extent to which participants were accurate and/or biased in judging the support they received from their partners (see Figure 1). The perceivers' reports of support receipt constituted the judgment, which was predicted by the truth and bias parameters; the slope coefficient for partners' reports of support provision constituted the truth force, and the slope coefficient for perceivers' own reports of support provision constituted the bias force.

The truth-and-bias models were applied to the data on the day and the (aggregated) person levels.¹ Following West and Kenny (2011), the

judgment, truth, and bias variables were centered on the truth variable (i.e., the providers' provision reports). Within person, centering was done by subtracting the mean (across times) of the truth variable (i.e., the mean of the partner's reports of support provision). This allowed us to remove broad individual differences when examining within-person fluctuations. Within person, centering was done by subtracting the grand mean (across persons and times) of the truth variable (i.e., the mean of all partners' reports of support provision).² In both cases, centering allows the intercept to represent the directional bias, the degree to which participants overestimated (positive intercept) or underestimated (negative intercept) their partner's support provision. The intercept reflects directional bias because it models the (centered) judgment value when the truth and the bias values equal zero. For example, in cases of overestimation, when the truth variable equals 0 (i.e., truth is at its average level), the centered outcome will be positive because the average judgment minus the average truth variable is positive; thus, the intercept, which reflects the level of the outcome when all other variables in the regression equation equal 0, will be positive.

The within-person directional bias represents the perceiver's tendency to over- or

as the separate (day vs. person) models. For simplicity's sake, and because in truth-and-bias models the outcome centering is different for day-level outcomes (centering around *persons'* truth means) and for person-level outcomes (centering around the *sample's* truth mean), we chose to use the separate models

2. To illustrate centering within the truth-and-bias model, consider the following example. On a given day, Sally reports having received four emotionally supportive behaviors, whereas Harry admits to providing only two. Additionally, Sally reports providing five emotionally supportive behaviors to Harry on this day. If, on average (across days), Harry reports providing three behaviors, Sally would have a (day-level) judgment variable of $(4 - 3 =) 1$, a (day-level) truth variable of $(2 - 3 =) -1$, and a (day-level) bias variable of $(5 - 3 =) 2$ on this particular day. Centering on the truth variable's mean occurs at the person level as well; let us say that Sally reports having received, on average, 4.2 supportive behaviors and providing, on average, 4.7 supportive behaviors. If the grand mean of support provision in the entire sample is 3.3, Sally's (person-level) judgment variable would be $(4.2 - 3.3 =) 0.9$; her (person-level) truth variable would be $(3 - 3.3 =) -0.3$; and her (person-level) bias variable would be $(4.7 - 3.3 =) 1.4$.

1. We also estimated two multilevel models (for emotional or for practical support) in which the truth and bias indices on both the day and person levels served as simultaneous predictors of day-level judgments. These analyses, modeled on those suggested by Bolger and Laurenceau (2013), yielded the same pattern of results

underestimate the provider's support provision compared to the provider's typical level. The between-person directional bias represents the general tendency of the entire sample to over- or underestimate support provision. Importantly, this model includes the partner's actual support provision (i.e., the truth variable); thus, the directional bias and the projection bias force parameters can be interpreted as being obtained above and beyond the real support receipt.

Day-level analyses

On the day level, two models assessed the degree to which judgments of being (emotionally or practically) supported on a particular day were predicted by the daily truth and bias forces and whether they were characterized by a (day-level) directional bias. Because our day-level data have a multilevel structure (days nested within persons, persons nested within couples), we used multilevel regression models (with the PROC MIXED procedure; SAS Institute, 2003). Such models have a within-individual level and a between-individual level, take into account the nonindependence of partners in a couple, and can accommodate nonbalanced data. Residuals within couples were allowed to correlate. A first-order autoregressive structure was imposed on the within-person residual covariance matrix. Effects were considered to be random, allowing the estimation of their (co-)variances.

The generic mixed equation was:

$$\begin{aligned} \text{Judgment}_{ijk} = & (\gamma_{00} + u_{0ij}) \\ & + (\gamma_{10} + u_{1ij}) * \text{Truth}_{ijk} \\ & + (\gamma_{20} + u_{2ij}) * \text{Bias}_{ijk} + e_{ijk} \end{aligned}$$

where the judgment of person i in couple j on day k is predicted by the average (i.e., fixed) directional bias intercept (γ_{00}) plus this person's variation from the averaged intercept (i.e., the random effect u_{0ij}); the average truth force slope (γ_{10}) plus this person's variation from this average (u_{1ij}) multiplied by this person's truth variable on the k th day (Truth_{ijk}); the average bias force slope (γ_{20}) plus this

person's variation from this average (u_{2ij}) multiplied by this person's bias variable on the k th day (Bias_{ijk}); and finally, this person's error term on this particular (k th) day (e_{ijk}). Using two dummy codes (female, male), we estimated separate parameters for women and men (i.e., using the two-intercept model; see Bolger & Laurenceau, 2013). Gender differences were assessed using planned contrasts.

Prior to testing these models, we conducted a preliminary analysis to determine whether emotional and practical support differ in their relational consequences. In a dyadic multilevel model, we predicted felt closeness as a function of daily judgments of emotional and practical support receipt. The judgment that emotional support was received was tied to greater closeness ($b = .16$, $SE = .02$, $p < .0001$ for men; $b = .17$, $SE = .02$, $p < .0001$ for women), whereas the judgment that practical support was received was not ($b = .01$, $SE = .02$, ns for men; $b = .00$, $SE = .02$, ns for women).

Table 1 displays the results of the day-level truth-and-bias analysis for *emotional support*. We calculated pseudo- R^2 for the model as recommended by Peugh (2014; cf. Snijders & Bosker, 1999). We specifically solved the mixed equation for each participant each day to obtain the daily predicted outcome for that participant; then, we estimated the R^2 between the predicted and the observed outcome. Using this procedure, we found that the model explained 63.2% of the variance in participants' judgments.

For both women and men, we expected to find overestimation (Hypothesis 3); however, the fixed directional bias was insignificant. Notably, the variances in the directional biases were significant for both genders. For both women and men, the fixed truth forces were positive and significant as we had expected (Hypothesis 1); on average, participants of either gender were accurate in tracking changes in their partner's emotional support provision. Notably, the variances in the truth forces were again significant for both genders. Nonetheless, assuming a normal distribution, the vast majority of women (98.4%) and men (97%) had a positive truth force, that is, were directly accurate to some degree. Finally, for both women and men, the fixed bias forces were

Table 1. Fixed (top) and random (bottom) estimates of the truth-and-bias model for daily emotional support

	Women			Men		
	Estimate (SE) 95% CI	t (df)	Effect size ^a	Estimate (SE) 95% CI	t (df)	Effect size
<i>Fixed effects^b</i>						
Directional bias	0.29 (0.16) [−0.03, 0.61]	1.83 (76.3)		0.14 (0.15) [−0.15, 0.44]	0.97 (77.3)	$D = 0.15$; $t = 0.69$
Truth force	0.35 (0.03) [0.29, 0.40]	12.55 (68)***	0.70	0.34 (0.03) [0.28, 0.39]	11.60 (66.6)***	$D = 0.01$; $t = 0.30$
Bias force	0.35 (0.03) [0.29, 0.42]	11.12 (64.5)***	0.66	0.30 (0.03) [0.25, 0.36]	10.49 (74.2)***	$D = 0.05$; $t = 1.26$
<i>Variances and covariances of random effects^c</i>						
1. W-Directional bias	1.97 (0.34)***	0.02 (0.22)	0.01 (0.04)	−0.01 (0.04)	0.02 (0.05)	−0.07 (0.04)
2. M-Directional bias		1.66 (0.28)***	−0.06 (0.04)	0.02 (0.04)	0.01 (0.04)	−0.01 (0.04)
3. W-Truth force			0.03 (0.01)**	0.00 (0.01)	−0.02 (0.01)*	−0.01 (0.01)
4. M-Truth force				0.03 (0.01)***	−0.01 (0.01)	0.00 (0.01)
5. W-Bias force					0.04 (0.01)**	0.01 (0.01)
6. M-Bias force						0.04 (0.01)***
						−0.07, 0.60

Note. W = women, M = men.

^aEffect sizes were estimated with semipartial R^2 for linear mixed models (Edwards, Muller, Wolfinger, Qaqish, & Schabenberger, 2008). ^b p values for fixed effects were based on two-tailed t tests with the Satterthwaite approximation method for computing degrees of freedom. ^c p values for random effects were based on one-tailed Wald z test because variances are constrained to be nonnegative. ^dThe range was based on individuals' random estimates.

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

also positive and significant as we had expected (Hypothesis 2); on average, participants were biased by their own support provision when judging their partners' emotional support provision. Notably, the variances in the bias force were significant for both genders. Nevertheless, assuming a normal distribution, the vast majority of women (96%) and men (94%) had a positive bias force. The truth and bias force coefficients were compared using planned contrasts; as we expected (Hypothesis 4), we found them not to differ significantly; the differences between estimates were -0.005 , $t(79) = -0.09$, ns , and 0.03 , $t(79) = 0.76$, ns , for women and men, respectively. As there were exploratory analyses, we examined both between-person and within-dyad associations among the three components; all within-dyad associations were nonsignificant, but we found one significant between-person association: a negative association between women's truth forces and bias forces ($r = -.51$, $p < .05$).

Table 2 displays the results of the day-level truth-and-bias analysis for *practical support*. The pseudo- R^2 for the model found it to explain 59.7% of the variance in participants' judgments.

For both women and men, we again expected to find overestimation (Hypothesis 3). For women, the fixed directional bias was indeed positive and significant; on average, women tended to overestimate their partner's practical support provision. Again, the variance in the directional bias was significant. Assuming a normal distribution of directional bias scores, approximately 60% of women overestimated their partner's practical support provision. Contrary to our expectation, the fixed directional bias for men did not differ from zero, though its variance was also significant. Notably, no significant gender difference emerged regarding the directional bias. For both women and men, the fixed truth forces were positive and significant as we had expected (Hypothesis 1) and did not differ along gender lines. On average, participants were accurate in tracking changes in their partner's practical support provision. The variances in the truth forces were also significant for both genders. Assuming a normal distribution, most of the women (94%) and the men

(93%) had a positive truth force, that is, were directly accurate to some degree. Finally, for both women and men, the fixed bias forces were also positive and significant as we had expected (Hypothesis 2) and did not differ along gender lines; on average, participants were biased by their own support provision when judging their partner's practical support provision. Again, the variances in the bias forces were significant for both genders. However, assuming a normal distribution, the majority of women (81%) and men (82%) had a positive bias force. As expected (Hypothesis 4), the truth force was twice as large as the bias force, and the differences between estimates, 0.14 , $t(79) = 2.74$, $p < .01$, and 0.19 , $t(79) = 3.88$, $p < .001$, for women and men, respectively, were significant.

For our exploratory analyses, we examined both between-person and within-dyad associations among the three components. All between-person associations were insignificant. In contrast, we found four significant within-dyad associations: (a) a negative association between partners' directional biases ($r = -.30$, $p < .05$), (b) a positive association between partners' truth forces ($r = .62$, $p < .01$), (c) a positive association between partners' bias forces ($r = .44$, $p < .05$), and (d) a negative association between women's truth force and their (male) partners' bias force ($r = -.50$, $p < .05$).

Aggregated person-level analyses

On the aggregate level, two models assessed the degree to which average judgments of being (emotionally or practically) supported over the 5 weeks of the study were predicted by the aggregate truth force and/or the aggregate bias force and whether they were characterized by an aggregate directional bias. To account for the nonindependence of partners within couples, multilevel regression models were used; residuals within couples were allowed to correlate, and separate estimates for women and men were obtained.

Table 3 (top) displays the results of the person-level truth-and-bias analysis for *emotional support*. The pseudo- R^2 for the model was found to explain 56.6% of the variance

Table 2. Fixed (top) and random (bottom) estimates of the truth-and-bias model for daily practical support

	Women			Men		
	Estimate (SE) 95% CI	t (df)	Effect size	Estimate (SE) 95% CI	t (df)	Effect size
<i>Fixed effect</i>						
Directional bias	0.30 (0.14) [0.01, 0.59]	2.10 (74.8)*		0.24 (0.13) [-0.03, 0.50]	1.80 (76.4)	D = 0.07; t = 0.29
Truth force	0.30 (0.03) [0.24, 0.37]	9.83 (58.1)***	0.62	0.36 (0.04) [0.28, 0.43]	9.94 (67.8)***	0.61 D = -0.05; t = -1.40
Bias force	0.17 (0.03) [0.10, 0.23]	5.08 (67)***	0.28	0.16 (0.03) [0.10, 0.22]	5.42 (86.9)***	0.25 D = 0.00; t = 0.04
<i>Variances and covariances of random effects</i>						
1. W-Directional bias	1.59 (0.27)***	-0.41 (0.18)*	0.04 (0.04)	-0.09 (0.04)	-0.02 (0.04)	-0.03 (0.04)
2. M-Directional bias		1.33 (0.23)***	-0.01 (0.04)	0.08 (0.04)	-0.04 (0.04)	0.00 (0.04)
3. W-Truth force			0.04 (0.01)**	0.03 (0.01)**	-0.02 (0.01)**	-0.02 (0.01)**
4. M-Truth force				0.06 (0.02)***	-0.01 (0.01)	-0.01 (0.01)
5. W-Bias force					0.04 (0.01)**	0.02 (0.01)*
6. M-Bias force						0.04 (0.01)***
Estimates range						

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

in participants' judgments. For women, the directional bias was positive and significant as we had expected (Hypothesis 6). Thus, women tended to overestimate their partners' emotional support provision. Contrary to our expectation, the directional bias for men was not significant. This gender difference was itself significant. Consistent with our expectation (Hypothesis 5), the truth forces were insignificant for either gender and did not differ between genders. Thus, on the aggregate level, the level of emotional support reported by the providers was not associated with the judgment of support receipt by the recipients. In contrast, for both women and men, the bias forces were significant as we had expected (Hypothesis 5) and did not differ along gender lines. Actors who report providing much emotional support themselves judge their partners as providing much support.

Table 3 (bottom) displays the results of the person-level truth and bias analysis for *practical support*. The pseudo- R^2 for the model was found to explain 44.3% of the variance in participants' judgments. For women, the directional bias was positive and significant as we had expected (Hypothesis 6); they tended to overestimate their partners' practical support provision. Contrary to our expectation, the directional bias for men was not significant. This gender difference was itself significant. Consistent with our expectation (Hypothesis 5), the truth forces were again insignificant for either gender and did not differ along gender lines; on the aggregate level, the level of practical support reported by the providers was not associated with the judgment of support receipt by the recipients. In contrast, for both women and men, the bias forces were significant as we had expected (Hypothesis 5) and did not differ along gender lines; actors who report providing much practical support themselves judged their partners as providing much support as well.

Discussion

Judgments of support receipt in committed couples' daily life are shaped by several factors. Our work, utilizing West and Kenny's (2011) novel truth-and-bias model, finds these

judgments to be tied to *reality*, but only in part. It also shows that one source of *bias* affecting these judgments is the tendency to project one's own supportiveness onto one's partner's behavior. Below, we review our results and discuss them from several theoretical perspectives including equity theory (Hatfield, Walster, & Berscheid, 1978; Walster, Berscheid, & Walster, 1973) and communal/exchange norms (Clark & Mills, 1979; Williamson & Clark, 1989).

Day-level judgments

Truth-and-bias forces

We first examined the relative balance between the forces that affect daily judgments of support receipt, considering two types of support (emotional vs. practical). We found recipients' judgment of emotional or practical support receipt on a particular day to be tied to partners' reports of having provided it. Evidence for this *truth force* implies that individuals accurately track daily fluctuations in their partner's support. It also echoes studies, utilizing other methods, that revealed individuals' moderate capacity to accurately track their partners' support (cf. Fletcher & Kerr, 2010; Haber et al., 2007).

We also found the recipients' judgment to be tied to their own reports of providing support to their partners. This finding echoes recent work by Lemay et al. (2008) showing the existence of projection in judgments of (more broadly defined) responsiveness.

The truth and bias forces found were equal in magnitude for emotional support judgments, whereas the truth force was twice as large as the bias force for practical support judgments. We expected to find this difference between subtypes of support and argued that it may be driven by the greater significance of emotional versus practical support, documented in the literature (e.g., Cutrona & Russell, 1990; Liu & Rook, 2013; Reinhardt et al., 2006). This interpretation is in line with Fiske and Taylor (1991), who suggested that biases should be more likely with regard to events of greater psychological significance. In line with the support literature (Shrout et al., 2010), our

own preliminary analyses demonstrated that emotional support carries greater relational consequences than does practical support.

The significance of the behaviors being judged is one factor driving the balance of truth and bias. As Fiske and Taylor (1991) have suggested, biases may also be more likely with regard to behaviors that are more ambiguous and open to alternative explanations. Indeed, when Lemay et al. (2007; cf. Debrot et al., 2012) focused on less concretely defined *responsiveness*, they found a “projection > truth” imbalance. Our work focused on *support*, which is more narrowly defined. This may explain why in our findings, the biased projection force was never stronger than the truth force. It also raises an alternative explanation for the different balance found with emotional and practical support, which may themselves differ in their concreteness. It is specifically possible that the judgment that emotional support has occurred is less concrete than the judgment that practical support has occurred. Emotional aspects of relationships (more so than behavioral aspects) require high levels of interpretation (e.g., Semin & Fiedler, 1988) and can be thought of as more abstract (and, relatedly, as more meaningful). Examining this possible explanation would require some measure of concreteness versus abstractness, which should be included in future research.

Directional bias

Based on earlier studies (e.g., Bolger et al., 2000; Gable et al., 2003) examining daily support perceptions, we expected that individuals will tend to overestimate the support they receive. Interestingly, this directional bias was found only for women and only regarding practical support. Gable et al. (2003) have shown such phantom support to positively predict relationship well-being at a level comparable to that of accurately perceived support. Interestingly, Fletcher and Kerr’s (2010) meta-analysis also found a general positive directional bias in judgments regarding the partner (e.g., regarding the partner’s thoughts, feelings, or personality traits), though not in studies examining either positive or negative

relationship behaviors such as love, criticism, or support (aka “interaction traits”), for which a *negative* directional bias was found, at least for women. We discuss the gender issue below.

Exploratory analyses

Finally, we explored the associations between the truth forces, bias forces, and directional biases, both between person and within dyad. Interestingly, only one between-person association (a negative association between women’s truth forces and bias forces) was found and only regarding emotion. The independence of these forces in shaping judgments regarding support receipt reinforces the need to consider them in isolation. Similar findings regarding the independence of directional biases and truth forces emerged from Fletcher and Kerr’s (2010) meta-analysis; however, the meta-analytical results were based on between-sample associations between the effect sizes rather than between-person associations among the parameter estimates. Moreover, our results extend this independence to the bias force as well.

As for within-dyad associations, none were found among the emotional support judgment parameters, but several did emerge among the practical support judgment parameters. In particular, couples were characterized by positively correlated levels of tracking accuracy and projected bias. There was also some evidence that the truth and bias forces are negatively associated at the dyadic level. In a sense, this suggests that accuracy (and low bias) can be thought of as dyad-level indices, with some couples being characterized by greater mutual accuracy (and lower bias) and others being characterized by greater mutual bias. Future work should explore what distinguishes such dyads (e.g., are longer relationships characterized by greater accuracy?) as well as what consequences such accuracy (and bias) patterns have (e.g., do accurate couples develop better relationships?). Finally, the partners’ directional biases were negatively associated, a finding that bears further exploration; one possibility is that overestimators partner with underestimators for reasons of complementarity (e.g., Bohns et al., 2013).

*Aggregated (person-level) judgments**Truth-and-bias forces*

We predicted that the broader scope question—what creates the tendency to judge that one receives support in general—may have different answers than the smaller scope question of daily support judgments addressed above. As expected, we found that for both genders and with both types of support, the bias force was significant whereas the truth force was not. The aggregated judgments of support receipt over the diary period, that is, the between-person differences in aggregated judgments, was driven not by individual differences in the partners' tendency to provide support but, instead, by individual differences in the *perceivers'* tendency to provide support. This is consistent with our suggestion that a second factor driving the balance of truth and bias is the scope of behavior being judged.

Notably, the absence of a truth force in aggregated judgments does not mean that perceivers are necessarily inaccurate. Accuracy can occur when (a) perceivers and targets are similar, *and* perceivers accurately assume that they are similar (thus, accurately projecting their own behavior onto the target) or (b) perceivers are attuned to the target's actual behaviors, regardless of the similarity. The former can be thought of as indirect accuracy and the latter as direct accuracy; the absence of direct accuracy in our results does not preclude the possibility of indirect accuracy, but this question is beyond the purview of the current analysis, which focuses on factors directly shaping judgments.

Directional bias

In partial support for our hypotheses, we found that women (but not men) overestimated the emotional and practical support they received. We expand on this gender difference below.

Gender differences

Fletcher and Kerr's (2010) meta-analysis reported mixed findings regarding gender differences in directional biases and in tracking accuracy (i.e., truth force). Given these findings along with the absence of any reported

gender differences in projected biases (e.g., Lemay et al., 2007), we explored such differences without a directional hypothesis in mind. On the day level, no such differences were found with either emotional or practical support. On the person level, we found evidence of women's overestimation of both emotional and practical support receipt; there was also a significant gender difference in the directional bias for both types of support. No differences were found with regard to the truth or projected bias forces. The finding that women overestimate support receipt is in line with Gagné and Lydon's (2003) position, which suggests that women are more oriented toward their relationships and thus may engage more readily in partner-serving biases. However, this gender difference should be considered cautiously and further replicated as close examination of men's confidence bounds indicates that they also had a tendency toward support overestimation.

What motivates the projection of support?

In this study, we found that controlling for real support receipt, couples tend to project their own supportive behaviors onto their partner, thus creating a biased perception of supportive mutuality. But what drives this perceptual bias? One explanation, inspired by equity theory (Hatfield et al., 1978; Walster et al., 1973), is that individuals may attempt to maintain psychological equity above and beyond real (behavioral) equity. Equity theory predicts that both conditions of *underbenefit* (i.e., contributions greater than gains) and of *overbenefit* (i.e., contributions lesser than gains) cause negative outcomes (though underbenefit is considered to be more detrimental; cf. Uehara, 1995). Over the years, equity theory received substantial support, both generally (e.g., Sechrist, Jill Sutor, Howard, & Pillemer, 2014) and specifically, within the context of intimate relationships (e.g., Davidson, Balwick, & Halverson, 1983; cf. Hatfield, Rapson, & Aumer-Ryan, 2008). For example, among dating couples, perceived inequity is associated with lower levels of satisfaction and commitment and with a higher likelihood of breakup (Sprecher, 2001). Among married couples, inequity

predicts greater future marital conflict and lower marital satisfaction (Grote & Clark, 2001). Most pertinently, equitable *support transactions* have been shown to be better than inequitable ones. For example, perceived supportive equity is tied to higher levels of self-esteem and positive moods and to lower levels of negative moods (e.g., Gleason, Iida, Bolger, & Shrout, 2003; Kleiboer, Kuijer, Hox, Schreurs, & Bensing, 2006; see Stoller, 1985).

One key proposition in equity theory is that people are motivated to eliminate the distress of inequitable conditions within relationships by restoring equity (Walster et al., 1973). Restoration may be achieved through (a) behaviorally altering the *actual* balance between contribution and gains, (b) psychologically altering the *perceptions* of balance, or (c) ultimately abandoning an inequitable relationship.

Several studies have demonstrated that people engage in *actual* behaviors to maintain equitable levels of support within relationships. For example, in a study of intimate cohabiting couples, Iida, Seidman, Shrout, Fujita, and Bolger (2008) found that individuals were more likely to report providing emotional support to their partner on days when they also received such support from their partner.

This study's findings may reflect the alternative way through which people restore a sense of equity within their relationships (short of ending it), namely, by psychologically altering the *perceptions* of balance between support receipt and provision (e.g., Sechrist et al., 2014). The obtained projection bias may specifically reflect perceivers' motivation to perceive supportive equity.

Some indirect support for this motivational account can be drawn from Lemay et al.'s (2007) work on the related phenomenon of projected *responsiveness*. These authors specifically demonstrated that such projection is independent of personality traits, relationship satisfaction, and positive illusions, which would have supported alternative theoretical explanations. Moreover, they showed that the projection of responsiveness is moderated by relationship commitment; those most highly committed to maintaining close relationships were most likely to project responsiveness

onto their partners. Our study could not test this motivational explanation (i.e., that perceivers project their own support onto their partners to maintain psychological equity) as it did not include any direct measure of the putative motivation. To fully test the motivational explanation, future studies could directly assess the perception of felt equity and the desire for it. Alternatively, they could experimentally manipulate felt equity and observe its effects on projected bias.

It should be noted that other theoretical perspectives disagree with the ideas of equity theory regarding committed relationships and maintain that partners within such relationships cohere more to a communal norm than to an exchange norm and are mostly unconcerned with equity restoration (cf. Clark & Mills, 1979; Williamson & Clark, 1989). Importantly, a communal norm perspective would still predict a projection bias. Individuals who specifically seek to maintain a mutual communal relationship would want it to be characterized by mutual caring; this desire would motivate them to have biased perceptions of their partner's support. To fully test whether the documented projected bias in our study reflects equity or communal considerations, future studies could include behaviors that differ in the degree of care they convey; a communal norm perspective would suggest that projection would occur more strongly in behaviors conveying greater care, whereas an equity perspective would suggest that projection would be equal across the care spectrum.

Limitations and future directions

We found the scope of judgment to be one factor influencing the balance between truth and bias. We did so by comparing the balance found in (smaller scope) day-to-day within-subject variation (i.e., one's temporal variations in feeling supported on a particular day) to that found in (larger scope) between-subject variation aggregated across the diary period (i.e., one's general tendency to feel supported within the relationship). These aggregated estimates were based on multiple assessment points (and thus had higher reliability) and reduced the need for retrospection

(and thus had higher external validity; see Bolger, Davis, & Rafaeli, 2003). An alternative approach for obtaining larger scope judgments could have relied on subjective global ratings of support receipt or provision (e.g., Barrera et al., 1981). These would have had the advantage of obtaining explicitly larger scope judgments. Future studies should compare these two methods (aggregated vs. explicit) to determine whether both yield the same effect on the truth–bias balance.

Support type was considered another factor influencing the truth–bias balance. In this study, we used the classical distinction in the support literature between emotional support and practical support, which echoes Lazarus's (1981) well-known classification of coping strategies into emotional-focused and problem-focused ones. We suggested that the more consequential type of support within intimate relationships (i.e., emotional support) would be subjected to greater projection. However, according to a recent theory regarding the mechanisms linking social support to health (Thoits, 2011), the consequences and significance of specific support types depend on the type of recipient–provider relationship. For example, *primary group members* (persons to whom individuals are emotionally tied; e.g., romantic partners) are more effective when providing emotionally sustaining behaviors (e.g., companionship, caring), whereas *secondary group members* (persons to whom individuals are more formally tied; e.g., coworkers) are more effective when providing active coping assistance (e.g., information, advice). Thus, to fully test the idea that projection plays a greater role when the behavior is more consequential to the recipient, future studies may wish to take into account the type of support and the type of relationship in conjunction.

The daily social support scales used in this study were behavioral counts. Their high reliabilities led us to treat them as representing a unified construct (emotional/practical support receipt/provision), and we tested the associations between judgment, truth, and bias on the scale level, as the truth-and-bias model requires. Future studies may wish to adopt other analytical approaches (e.g., quasi-signal

detection; see Bar-Kalifa & Rafaeli, 2013; Gable et al., 2003) to provide insights regarding the factors that affect the accuracy–bias balance on the *item* level. Importantly, our dichotomous support items are not sensitive to accuracy or bias levels on the item level. For example, no bias would be detected in cases in which high levels of a particular supportive behavior are provided, while the recipient perceives only moderate levels. Future studies may benefit from incorporating more detailed and sensitive daily measures.³

One additional methodological issue relevant to our study is the fact that our estimate of the bias force relies on an actor effect, that is, on data obtained from the same person (the perceiver's own support provision and their perception of the partner's provision), whereas our estimate of the truth force relies on a partner effect, that is, on data obtained from the two partners (the provider's report of their own support provision and the perceiver's perception of that provision). The shared source inherent in actor effects may artifactually inflate these effects (Orth, 2013). Such artifacts may have played a part in our person-level results, where we only found a significant projected bias force (actor effect) and no truth force (partner effect). Future studies could circumvent this issue by using objective observers to provide impartial estimates of the actors' and partners' behavior, using these as the benchmark to which the actors' judgments are compared (see, e.g., Lemay & Neal, 2014; doing so would also solve the problem of referring to the provider's viewpoint as "truth"). Alternatively, future studies could adjust for other variables that are equally affected by the method variance (e.g., Lemay & Clark, 2008, in which actors' care for a third person was assessed using an identical measure and was adjusted for when testing projection) and thus reduce the risk that the larger actor effect is attributable solely to a shared source.

3. Because the outcome (i.e., judgment) in truth-and-bias models is operationalized as a difference score (the perception minus the mean truth variable), its distribution was approximately normal. Though the support measures themselves were behavioral counts, we used regular multilevel modeling (and not generalized linear mixed models) analyses.

Though the shared source artifact may have played some role in the person-level effects, it is noteworthy that it does not seem to play a major role in our day-level results. On the day level, the partner effects (the truth forces) were as strong as, or stronger than, the actor effects (the bias forces). In other words, it seems that the moderators we discussed with regard to projected bias processes (namely, psychological significance or scope) may also moderate this statistical artifact. This methodological moderator should be further tested in future studies examining both actor and partner effects within the actor-partner interdependence model framework (cf. Kenny, Kashy, & Cook, 2006).

It is noteworthy that on average, our participants experienced mild levels of stress but nevertheless reported some levels of support provision and receipt more often than not. This pattern is consistent with recent theoretical conceptualizations of support. For example, relational regulation theory (Lahey & Orehek, 2011) posits that support exerts its effect through mundane and ordinary yet affectively consequential shared activity rather than through directly buffering stressors. Nonetheless, it would be important to test whether the study's findings regarding the balance between accuracy and bias may differ among couples facing acute stress as different needs are more pronounced in the context of high versus low stress levels (see e.g., Bolger et al., 2000, who found that support visibility effect is hinged on levels of stress).

Finally, our model found both fixed and random effects. The latter were consistently significant, indicating that a considerable degree of between-subject variation is yet to be explained. Future research should explore personal and relational factors that moderate the strength of the truth force, bias force, or the directional bias (e.g., Knoll, Burkert, & Schwarzer, 2006).

Summary, synthesis, and broader implications

Perceiving our partners as supportive has been consistently tied to beneficial outcomes within relationships (cf. Uchino, 2009). Our results indicate that both truth and bias forces play

a part in shaping such perceptions. These results are consistent with the view that individuals restore a sense of equity within their relationship by psychologically altering the perceptions of balance between support receipt and provision.

Our study is the first to apply the truth-and-bias model (West & Kenny, 2011) within a study exploring supportiveness in the daily life of committed couples. It allowed us to simultaneously explore two different forms of bias alongside accuracy. And it explored whether two factors, the scope of behavior being judged and its psychological significance, alter the balance between truth and bias.

The findings regarding over- or underestimation (i.e., directional bias) indicated that women tended to overestimate support receipt; no such overestimation was found among men. The findings regarding accuracy indicated that partners tend to be accurate when it comes to the presence of specific, concrete, and less emotionally significant supportive events but less so when it comes to broader, less concrete, and more emotionally significant ones, as predicted. Finally, the clearest picture emerged with the findings assessing the projection bias. This bias was found to be quite pervasive; individuals projected their own supportive behavior onto their perception of their partners' across types and scopes of support.

Within relationships, people may be driven by two (somewhat conflicting) motivations, toward accuracy and toward perceived equity, which may nevertheless serve a common ultimate purpose, namely, maintaining relational well-being. Accuracy may do so by increasing coordination, predictability, or controllability. Perceived equity, for its part, may do so through more emotional means, particularly the avoidance of the distress tied to violations of reciprocity and fairness norms.

The unique contribution of this study is in demonstration that these two motivations can, and should, be considered in tandem. One of its possible implications is that efforts to improve relational well-being may benefit not only from a focus on improving perceivers' accuracy regarding their partners' behaviors but also from changing the perceiver's own supportive

behavior, which may serve as an indirect (projected) path to greater relational well-being.

References

- Abbey, A., Andrews, F. M., & Halman, L. J. (1995). Provision and receipt of social support and disregard: What is their impact on the marital life quality of infertile and fertile couples? *Journal of Personality and Social Psychology*, 68, 455–469. doi:10.1037/0022-3514.68.3.455
- Bar-Kalifa, E., & Rafaeli, E. (2013). Disappointment's sting is greater than help's balm: Quasi-signal-detection of daily support matching. *Journal of Family Psychology*, 27, 956–967. doi:10.1037/a0034905
- Barrera, M., Sandler, I. N., & Ramsay, T. B. (1981). Preliminary development of a scale of social support: Studies on college students. *American Journal of Community Psychology*, 9, 435–447. doi:10.1007/BF00918174
- Beck, L. A., Pietromonaco, P. R., DeVito, C. C., Powers, S. I., & Boyle, A. M. (2013). Congruence between spouses' perceptions and observers' ratings of responsiveness the role of attachment avoidance. *Personality and Social Psychology Bulletin*, 40, 164–174. doi:10.1177/0146167213507779
- Bohns, V. K., Lucas, G. M., Molden, D. C., Finkel, E. J., Coolsen, M. K., Kumashiro, M., ... Higgins, E. T. (2013). Opposites fit: Regulatory focus complementarity and relationship well-being. *Social Cognition*, 31, 1–14. doi:10.1521/soco.2013.31.1.1
- Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology*, 54, 579–616. doi:10.1146/annurev.psych.54.101601.145030
- Bolger, N., & Laurenceau, J. P. (2013). *Intensive longitudinal methods: An introduction to diary and experience sampling research*. New York, NY: Guilford.
- Bolger, N., Zuckerman, A., & Kessler, R. C. (2000). Invisible support and adjustment to stress. *Journal of Personality and Social Psychology*, 79, 953–961. doi:10.1037/0022-3514.79.6.953
- Clark, M. S., & Mills, J. (1979). Interpersonal attraction in exchange and communal relationships. *Journal of Personality and Social Psychology*, 37, 12–24. doi:10.1037/0022-3514.37.1.12
- Coriell, M., & Cohen, S. (1995). Concordance in the face of a stressful event: When do members of a dyad agree that one person supported the other? *Journal of Personality and Social Psychology*, 69, 289–299. doi:10.1037/0022-3514.69.2.289
- Cutrona, C. E., & Russell, D. W. (1990). Type of social support and specific stress: Toward a theory of optimal matching. In B. R. Sarason, I. G. Sarason, & G. R. Pierce (Eds.), *Social support: An interactional view* (pp. 319–366). New York, NY: Wiley.
- Cutrona, C. E., Shaffer, P. A., Wesner, K. A., & Gardner, K. A. (2007). Optimally matching support and perceived spousal sensitivity. *Journal of Family Psychology*, 21, 754–758. doi:10.1037/0893-3200.21.4.754
- Davidson, B., Balswick, J., & Halverson, C. (1983). Affective self-disclosure and marital adjustment: A test of equity theory. *Journal of Marriage and the Family*, 45, 93–102.
- Debrot, A., Cook, W. L., Perrez, M., & Horn, A. B. (2012). Deeds matter: Daily enacted responsiveness and intimacy in couples' daily lives. *Journal of Family Psychology*, 26, 617–627. doi:10.1037/a0028666
- Edwards, L. J., Muller, K. E., Wolfinger, R. D., Qaqish, B. F., & Schabenberger, O. (2008). An R2 statistic for fixed effects in the linear mixed model. *Statistics in Medicine*, 27, 6137–6157. doi:10.1002/sim.3429
- Finkenauer, C., & Righetti, F. (2011). Understanding in close relationships: An interpersonal approach. *European Review of Social Psychology*, 22, 316–363. doi:10.1080/10463283.2011.633384
- Fiske, S. T., & Taylor, S. E. (1991). *Social cognition* (2nd ed.). New York, NY: McGraw-Hill.
- Fletcher, G. J., & Kerr, P. S. (2010). Through the eyes of love: Reality and illusion in intimate relationships. *Psychological Bulletin*, 136, 627–658. doi:10.1037/a0019792
- Gable, S. L., Reis, H. T., & Downey, G. (2003). He said, she said a quasi-signal detection analysis of daily interactions between close relationship partners. *Psychological Science*, 14, 100–105. doi:10.1111/1467-9280.t01-1-01426
- Gagné, F. M., & Lydon, J. E. (2003). Identification and the commitment shift: Accounting for gender differences in relationship illusions. *Personality and Social Psychology Bulletin*, 29, 907–919. doi:10.1177/0146167203029007009
- Gleason, M. E., Iida, M., Bolger, N., & Shrout, P. E. (2003). Daily supportive equity in close relationships. *Personality and Social Psychology Bulletin*, 29, 1036–1045. doi:10.1177/0146167203253473
- Gleason, M. E., Iida, M., Shrout, P. E., & Bolger, N. (2008). Receiving support as a mixed blessing: Evidence for dual effects of support on psychological outcomes. *Journal of Personality and Social Psychology*, 94, 824–838. doi:10.1037/0022-3514.94.5.824
- Grote, N. K., & Clark, M. S. (2001). Perceiving unfairness in the family: Cause or consequence of marital distress? *Journal of Personality and Social Psychology*, 80, 281–293. doi:10.1037/0022-3514.80.2.281
- Haber, M. G., Cohen, J. L., Lucas, T., & Baltes, B. B. (2007). The relationship between self-reported received and perceived social support: A meta-analytic review. *American Journal of Community Psychology*, 39, 133–144. doi:10.1007/s10464-007-9100-9
- Hatfield, E., Rapson, R. L., & Aumer-Ryan, K. (2008). Social justice in love relationships: Recent developments. *Social Justice Research*, 21, 413–431. doi:10.1007/s11211-008-0080-1
- Hatfield, E., Walster, G. W., & Berscheid, E. (1978). *Equity: Theory and research*. Boston, MA: Allyn & Bacon.
- House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science*, 241, 540–545. doi:10.1126/science.3399889

- Iida, M., Seidman, G., Shrout, P. E., Fujita, K., & Bolger, N. (2008). Modeling support provision in intimate relationships. *Journal of Personality and Social Psychology*, 94, 460–478. doi:10.1037/0022-3514.94.3.460
- Ickes, W., & Simpson, J. A. (2001). Motivational aspects of empathic accuracy. In G. J. O. Fletcher & M. Clark (Eds.), *The Blackwell handbook of social psychology: Interpersonal processes* (pp. 229–249). Oxford, England: Blackwell.
- Katz, J., Monnier, J., Libet, J., Shaw, D., & Beach, S. R. (2000). Individual and crossover effects of stress on adjustment in medical student marriages. *Journal of Marital and Family Therapy*, 26, 341–351. doi:10.1111/j.1752-0606.2000.tb00303.x
- Kenny, D. A., Kashy, D., & Cook, W. L. (2006). *Dyadic data analysis*. New York, NY: Guilford.
- Kleiboer, A. M., Kuijer, R. G., Hox, J. J., Schreurs, K. M., & Bensing, J. M. (2006). Receiving and providing support in couples dealing with multiple sclerosis: A diary study using an equity perspective. *Personal Relationships*, 13, 485–501. doi:10.1111/j.1475-6811.2006.00131.x
- Knoll, N., Burkert, S., & Schwarzer, R. (2006). Reciprocal support provision: Personality as a moderator? *European Journal of Personality*, 20, 217–236. doi:10.1002/per.581
- Lahey, B., & Cronin, A. (2008). Low social support and major depression: Research, theory and methodological issues. In K. S. Dobson & D. Dozois (Eds.), *Risk factors for depression* (pp. 385–408). San Diego, CA: Academic Press.
- Lahey, B., & Orehek, E. (2011). Relational regulation theory: A new approach to explain the link between perceived social support and mental health. *Psychological Review*, 118, 482–495. doi:10.1037/a0023477
- Lazarus, R. S. (1981). The stress and coping paradigm. In C. Eisdorfer, D. Cohen, A. Kleinman, & P. Maxum (Eds.), *Models for clinical psychopathology* (pp. 177–214). New York, NY: Spectrum.
- Lemay, E. P., Jr., & Clark, M. S. (2008). How the head liberates the heart: Projection of communal responsiveness guides relationship promotion. *Journal of Personality and Social Psychology*, 94, 647–671. doi:10.1037/0022-3514.94.4.647
- Lemay, E. P., Jr., Clark, M. S., & Feeney, B. C. (2007). Projection of responsiveness to needs and the construction of satisfying communal relationships. *Journal of Personality and Social Psychology*, 92, 834–853. doi:10.1037/0022-3514.92.5.834
- Lemay, E. P., Jr., & Neal, A. M. (2013). The wishful memory of interpersonal responsiveness. *Journal of Personality and Social Psychology*, 104, 653–672. doi:10.1037/a0030422
- Lemay, E. P., Jr., & Neal, A. M. (2014). Accurate and biased perceptions of responsive support predict well-being. *Motivation and Emotion*, 38, 270–286. doi:10.1007/s11031-013-9381-2
- Lindorff, M. (2000). Is it better to perceive than receive? Social support, stress and strain for managers. *Psychology, Health & Medicine*, 5, 271–286. doi:10.1080/713690199
- Liu, B. S., & Rook, K. S. (2013). Emotional and social loneliness in later life: Associations with positive versus negative social exchanges. *Journal of Social and Personal Relationships*, 30, 813–832. doi:10.1177/0265407512471809
- Monahan, D. J., & Hooker, K. (1995). Health of spouse caregivers of dementia patients: The role of personality and social support. *Social Work*, 40, 305–314. doi:10.1093/sw/40.3.305
- Norton, T. R., & Manne, S. L. (2007). Support concordance among couples coping with cancer: Relationship, individual, and situational factors. *Journal of Social and Personal Relationships*, 24, 675–692. doi:10.1177/0265407507081454
- Orth, U. (2013). How large are actor and partner effects of personality on relationship satisfaction? The importance of controlling for shared method variance. *Personality and Social Psychology Bulletin*, 39, 1359–1372. doi:10.1177/0146167213492429
- Pasch, L. A., Harris, K. W., Sullivan, K. T., & Bradbury, T. N. (2004). The social support interaction coding system. In P. Kerig & D. Baucom (Eds.), *Couple observational coding systems* (pp. 319–334). New York, NY: Guilford.
- Peugh, J. L. (2014). Conducting three-level cross-sectional analyses. *Journal of Early Adolescence*, 34, 7–37. doi:10.1177/0272431613498646
- Pollak, K. I., McBride, C. M., Baucom, D. H., Curry, S. J., Lando, H., Pirie, P. L., & Grothaus, L. C. (2001). Women's perceived and partners' reported support for smoking cessation during pregnancy. *Annals of Behavioral Medicine*, 23, 208–214. doi:10.1207/S15324796ABM2303_8
- Reinhardt, J. P., Boerner, K., & Horowitz, A. (2006). Good to have but not to use: Differential impact of perceived and received support on well-being. *Journal of Social and Personal Relationships*, 23, 117–129. doi:10.1177/0265407506060182
- Reis, H. T., Clark, M. S., & Holmes, J. G. (2004). Perceived partner responsiveness as an organizing construct in the study of intimacy and closeness. In D. J. Mashek & A. Aron (Eds.), *Handbook of closeness and intimacy* (pp. 201–225). Mahwah, NJ: Erlbaum.
- SAS Institute. (2003). *The SAS system for Windows (Version 8.02)* [Software]. Cary, NC: Author.
- Sechrist, J., Jill Sutor, J., Howard, A. R., & Pillemer, K. (2014). Perceptions of equity, balance of support exchange, and mother–adult child relations. *Journal of Marriage and Family*, 76, 285–299. doi:10.1111/jomf.12102
- Semin, G. R., & Fiedler, K. (1988). The cognitive functions of linguistic categories in describing persons: Social cognition and language. *Journal of Personality and Social Psychology*, 54, 558–568. doi:10.1037/0022-3514.54.4.558
- Shrout, P. E., Bolger, N., Iida, M., Burke, C., Gleason, M. E. J., & Lane, S. P. (2010). The effects of daily support transactions during acute stress: Results from a diary study of bar exam preparation. In K. T. Sullivan & J. Davila (Eds.), *Support processes in intimate*

- relationships (pp. 291–317). New York, NY: Oxford University Press.
- Shrout, P. E., & Lane, S. P. (2012). Psychometrics. In M. R. Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 302–320). New York, NY: Guilford.
- Snijders, T. A. B., & Bosker, R. J. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. London, England: Sage.
- Sprecher, S. (2001). Equity and social exchange in dating couples: Associations with satisfaction, commitment, and stability. *Journal of Marriage and Family*, 63, 599–613. doi:10.1111/j.1741-3737.2001.00599.x
- Stoller, E. P. (1985). Exchange patterns in the informal support networks of the elderly: The impact of reciprocity on morale. *Journal of Marriage and the Family*, 45, 335–342.
- Swann, W. B., Stein-Seroussi, A., & Giesler, R. B. (1992). Why people self-verify. *Journal of Personality and Social Psychology*, 62, 392–401. doi:10.1037/0022-3514.62.3.392
- Thoits, P. A. (1986). Social support as coping assistance. *Journal of Consulting and Clinical Psychology*, 54, 416–423.
- Thoits, P. A. (2011). Mechanisms linking social ties and support to physical and mental health. *Journal of Health and Social Behavior*, 52, 145–161.
- Uchino, B. N. (2009). Understanding the links between social support and physical health: A life-span perspective with emphasis on the separability of perceived and received support. *Perspectives on Psychological Science*, 4, 236–255. doi:10.1111/j.1745-6924.2009.01122.x
- Uehara, E. S. (1995). Reciprocity reconsidered: Gouldner's moral norm of reciprocity' and social support. *Journal of Social and Personal Relationships*, 12, 483–502. doi:10.1177/0265407595124001
- Vinokur, A. D., & Vinokur-Kaplan, D. (1990). "In sickness and in health" patterns of social support and undermining in older married couples. *Journal of Aging and Health*, 2, 215–241. doi:10.1177/089826439000200205
- Walster, E., Berscheid, E., & Walster, G. W. (1973). New directions in equity research. *Journal of Personality and Social Psychology*, 25, 151–176. doi:10.1037/h0033967
- West, T. V., & Kenny, D. A. (2011). The truth-and-bias model of judgment. *Psychological Review*, 118, 357–378. doi:10.1037/a0022936
- Williamson, G. M., & Clark, M. S. (1989). Providing help and desired relationship type as determinants of changes in moods and self-evaluations. *Journal of Personality and Social Psychology*, 56, 722–734. doi:10.1037/0022-3514.56.5.722
- Xu, Y., & Burleson, B. R. (2004). The association of experienced spousal support with marital satisfaction: Evaluating the moderating effects of sex, ethnic culture, and type of support. *Journal of Family Communication*, 4, 123–145. doi:10.1207/s15327698jfc0402_3