Agreement and understanding about honesty and deception rules in romantic relationships

Katlyn Elise Roggensack¹ and Alan Sillars²

Abstract

This research describes perceived rules pertaining to honesty in romantic relationships, identifies sources of accuracy and bias affecting consensus on rules, and clarifies implications for couple conflict. Couples typically idealize honesty; yet, situational rules are vulnerable to different interpretations due to ambiguous properties of deception and pressures to balance openness with discretion. The research distinguishes obligatory rules, which prescribe disclosure or proscribe deception, and discretionary rules, which grant flexibility. Couples agreed on obligatory rules more than discretionary rules, although females endorsed obligatory rules more than males. Individuals overestimated agreement, overattributed sex-stereotypic rule endorsement to the partner, and showed minimal understanding of expectations unique to the partner. Agreement on obligatory rules was associated with lower conflict, whereas understanding predicted greater conflict.

Keywords

Agreement, conflict, deception, interpersonal communication, rules, understanding

¹ University of California, USA
² University of Montana, USA

Corresponding author:
Katlyn Elise Roggensack, University of California, Santa Barbara, 4005 SS&MS, Santa Barbara, CA 93106-4020, USA.
Email: katlyn@umail.ucsb.edu
In close relationships, individuals negotiate expectations for how each person should act in a given context. These *relationship rules* are prescriptions for issues such as honesty, conflict management, and time allocation (e.g., Jones & Gallois, 1989; West, 2006) that create predictability and may reduce conflicts (Roloff & Miller, 2006). However, rule negotiation is an ongoing process with a degree of ambiguity. A prominent category of rules reflects the theme of *honesty*. Romantic partners typically idealize honesty and see lying as manipulative and unacceptable. Yet, enacted meanings for honesty can vary; for example, one partner might see honesty as unconditional, while another believes only certain information must or should be disclosed. Thus, two partners may endorse honesty as an ideal but apply different standards to situations when pragmatic concerns make it difficult to be completely honest (Metts, 1989).

In the current study, we examine agreement and understanding about honesty/deception rules among romantic couples. The research provides a novel perspective on information management in relationships (see Afifi & Afifi, 2009). Although deception tends to be equated with a narrow range of behavior, we maintain that deception is not easily distinguished from other forms of information management (secrecy, avoidance, equivocation, etc.), except insofar as couples establish consensus on rules defining and regulating acts as deceptive. Coordinating these rules is sometimes a difficult process for couples to manage. These ideas are investigated in research that first identified typical rules for honesty/deception and then examined interpersonal perceptions about rules. Given the ambiguous nature of honesty/deception, we expected subjective biases to affect understanding of rules. Given the extent to which honesty is idealized, we expected disagreement about rules to predict relationship conflict.

**Rationale**

Our rationale connects three literatures—communication rules, deception, and interpersonal perception. Rules theorists argue that coordination of meaning and action is accomplished through consensus on communication rules; however, consensus is problematic when rules are ambiguous (Cushman & Whiting, 1972; Pearce, 1976). Deception literature adds that ambiguity is partly inherent to notions of truthfulness and deceit. Interpersonal perception research identifies sources of accuracy and bias in relational judgments that underlie or undermine consensus and impact compatibility, albeit in complex ways (see Cuperman, Howland, Ickes, & Simpson, 2011; Fletcher & Kerr, 2010). Thus, the literature studies provide complementary accounts of the factors affecting rule consensus and relationship conflict.

**Background on relationship rules**

Rules for honesty/disclosure are among the most prominent categories in various rule typologies (Argyle & Henderson, 1984; Baxter, Dun, & Sahlstein, 2001; West, 2006). Rules both define what counts as honesty or deception (i.e., constitutive rules) and specify expectations regulating such acts (i.e., procedural or regulative rules) (Cushman & Whiting, 1972). The current study primarily considers regulative rules; however, the potential for conflict over honesty/deception partly stems from inconsistent ideas about
what constitutes honesty. The current study is further concerned with perceived rules. Although some rules theorists see a rule as an abstraction for an observed interaction pattern with no clear phenomenological status (e.g., Jackson, 1965), others regard rules as knowledge structures that are partly conscious—at the very least, people can recognize rule violations (Collett, 1977). However, rules may evolve with or without explicit acknowledgement. West (2006) found that 80% of intimate couples agreed on rules for disclosure, yet only 25% discussed these rules.

The concept of a (perceived) rule is similar to what others have called ideals, standards, and lay theories (Caughlin, 2003; Fletcher & Thomas, 1996). However, the rule concept is more operationally concrete than other forms of relationship knowledge. Rules specify actions that are permissible, required, or prohibited in a certain context. Rules are connected to broader ideals and standards, which are beliefs about what relationships should be like (Caughlin, 2003). However, ideals and standards represent abstract goals that gloss over specific conceptions of how one should act. For example, the standard of openness in addressing problems (Caughlin, 2003) could reference various rules about how one should be open.

Rules theorists regard consensus as a necessary condition for coordinated action (Cushman & Whiting, 1972; Pearce, 1976). Although consensus on rules is readily achieved in many areas, consensus can be elusive when rules are contradictory, non-specific, or incomplete (Cushman & Whiting, 1972; Pearce, 1976). Honesty/deception rules are potentially problematic, since the rules are often ambiguous, yet are taken quite seriously.

**Distinctive characteristics of honesty/deception rules**

North American culture is said to reflect an “ideology of openness” that stresses honesty and transparency in relationships (Afifi, Caughlin, & Afifi, 2007; Parks, 1982). After infidelity, deception was most frequently cited as “the worst thing one could do to a relationship partner” (West, 2006, p. 130). This suggests that couples are likely to agree on honesty as an abstract ideal. However, situational rules for honesty are more complex, given (1) the often subtle nature of deception and (2) competing demands for honesty versus discretion.

Although deception is common in close relationships (Cole, 2001; Metts, 1989), it does not necessarily represent obvious fabrication. As Burgoon and Levine (2010) observe:

> Deception comes in a variety of guises, from flat-out lies, elaborate fabrications, misdirection and exaggerations, to evasions, equivocations, concealments, omissions, strategic ambiguity ... to more subtle misdirection and camouflage. (p. 202)

Although deception can range from outright lies to far more equivocal acts, ambiguous forms, such as omission or avoidance, tend to predominate (Burgoon & Levine, 2010; Cole, 2001; Peterson, 1996). Thus, the same act may appear deceptive to one person but not to another. Moreover, even in the case of direct lies, people are not very successful in detecting deception and generally assume that truth is being told regardless of message
veracity (Burgoon & Levine, 2010). Individuals think they have the ability to detect when others are lying, although confidence is unrelated to accuracy (Burgoon & Levine, 2010). Interestingly, participants in one study reported telling more lies than they thought romantic partners told them (Cole, 2001). These findings suggest that individuals may mistakenly believe their partners rarely deceive, and also believe that they are able to detect lies more than they actually do.

We might expect people to recognize deception more readily in close relationships, where there is greater context for interpreting messages. Yet, most studies show little association between relational involvement and accuracy of veracity judgments (Levine & McCornack, 1992). Involvement does appear to boost confidence in judging deception, which decreases accuracy (Levine & McCornack, 1992). Other research suggests that motivation to protect or enhance relationships can override motivation to accurately perceive the partner (Cuperman et al., 2011). Potentially then, romantic partners might overlook signs of deception in order to view the relationship positively. Once deception is revealed, however, the emotional consequences are greater in close relationships (McCornack & Levine, 1990).

A second factor that complicates situational interpretation of honesty is the tension between goals that favor honesty versus discretion. For example, relational partners commonly disclose some secrets and keep others; furthermore, both contextual disclosure and contextual secrecy predict marital satisfaction (Finkenauer & Hazam, 2000). Relational partners may avoid topics or withhold secrets to protect the partner or relationship (Afifi et al., 2007). Similarly, individuals do not characteristically lie to intentionally hurt another but to avoid conflict, control the level of intimacy, and serve other relational goals (DePaulo, Morris, & Sternglanz, 2009; Metts, 1989). Generally, individuals are reluctant to tell lies unless the truth poses an obstacle for their goals (Levine, Kim, & Hamel, 2010). Thus, deception is best seen as a form of in situ problem solving responsive to competing demands (McCornack, 1997).

Given these situational complexities, the question remains whether couples share rules for honesty and deception and whether they are aware of the other’s expectations.

**Interpersonal perception of relationship rules**

Interpersonal perception and coorientation models (Laing, Philipsen, & Lee, 1966; Mcleod & Chaffee, 1973) provide a means to analyze consensus on rules (Cushman & Whiting, 1973). Although consensus is often equated with agreement, Scheff (1967) argued that agreement alone cannot account for many examples of coordinated action. In Scheff’s view, consensus is more broadly concerned with coorientation or reciprocal orientation to the other’s perspective. Following Laing et al. (1966), we distinguish coorientation states based on the combination of direct perspectives (i.e., one person’s rule endorsement) and meta-perspectives (i.e., one’s estimate of the partner’s rule endorsement). Agreement is the congruence of two direct perspectives. Perceived agreement is the congruence of a person’s meta-perspective and their own direct perspective. Understanding is the congruence of one’s meta-perspective and the partner’s direct perspective. (McLeod and Chaffee label the same states agreement, congruency, and accuracy.)
To the extent that two people disagree about relational rules but understand one another, they might work to clarify rules or adjust expectations in anticipation of potential conflicts. However, understanding is potentially clouded by inferential biases characteristic of close relationships, including selective attention to information that supports existing theories (Fletcher & Kerr, 2010; Sillars, 2011), over-confidence in understanding (Kenny & Acitelli, 2001; Sillars & Scott, 1983), and motivated inaccuracy about threatening information (Cuperman et al., 2011). Intimate partners demonstrate significant accuracy along with bias (Fletcher & Kerr, 2010; Kenny & Acitelli, 2001). However, bias should be greater when the object of perception is more ambiguous (Sillars et al., 1994). As Cushman and Whiting (1972) note, consensus is more readily achieved for rules that are easily tested against external realities. Thus, we might expect lower understanding of honesty/deception rules by comparison to say, housework or spending practices.

As envisioned by Mead (1934), the process that leads to understanding begins with the projection of one’s own experience followed by cycles of hypothesis checking and reformulation to account for the other’s symbolic actions. There is abundant evidence that people project their experience to others; moreover, projection can be a functional basis for understanding others when there is actual agreement (Fletcher & Kerr, 2010; Kenny & Acitelli, 2001). However, projection can also yield inferential errors that are not self-correcting, as seen in the pervasive tendency by intimate couples to overestimate agreement (Sillars & Scott, 1983). Inferences about others may also reflect stereotypic knowledge (Kenny & Acitelli, 1994), such as expectations for male/female standards of openness (Afifi & Joseph, 2009). As with projection, stereotypes sometimes provide a valid basis for understanding the partner (Acitelli, Kenny, & Weiner, 2001). However, it is useful to distinguish between understanding resulting from stereotypes or projection versus perspective taking based on the effortful process of cognitive decentering and perception checking. Thus, we distinguish raw understanding (overall ability to predict the partner’s perspective) and differential understanding (understanding of unique elements of the partner’s perspective; see Gage & Cronbach, 1955).

The extent to which people agree, perceive agreement, and show understanding varies depending on a number of factors (Sillars, 2011). We pose a research question about these interpersonal perceptions, along with two hypotheses that have considerable support.

**RQ1:** To what extent do couples agree, perceive agreement, and show understanding on rules?

**H1:** Perceived agreement on honesty/deception rules exceeds actual agreement.

**H2:** Perceived and actual agreement on honesty/deception rules exceeds understanding.

Several studies indicate that individuals lack meta-awareness of misunderstanding in close relationships and show over-confidence in knowledge of the partner (see Ickes, 2003; Kenny & Acitelli, 2001; Sillars & Scott, 1983; Swann & Gill, 1997). To consider whether people show accurate meta-knowledge in the present context, we add the following question:
**RQ2:** Does confidence in knowledge of the partner predict understanding of rules?

Intuitively, we expect greater understanding and agreement in more established and intimate relationships. However, research provides a mixed picture. Studies show greater understanding among dating partners versus friends and strangers, but no association between the length of romantic relationships and understanding (see Sillars, 2011). Acitelli et al. (2001) found that the relationship length was associated with agreement but not with understanding. As noted, relational involvement does not predict deception detection accuracy (McCornack, 1992). Given the mixed implications of previous research, we pose a question:

**RQ3:** Are relationship characteristics (status, length, and commitment) associated with agreement and (differential) understanding of honesty/deception rules?

**Obligatory and discretionary rules**

Following Cushman and Whiting (1972), regulative rules specify either what is required/prohibited or what is permitted. Thus, honesty/deception rules might require information to be revealed and not distorted (which we label *obligatory rules*), or specify contexts in which discretion is permissible or advisable (*discretionary rules*). Both forms appear common. In Baxter et al. (2001), 10% of rules for romantic relationships called for openness and honesty, whereas 7% involved informational discretion. Moreover, given competing demands surrounding honesty, individuals might endorse both rule types simultaneously.

Afifi and Joseph (2009) argue that females maintain a higher standard of openness than males. Thus, we might find greater obligatory rule endorsement among females and greater discretionary rule endorsement among males. Rule endorsement might also reflect relationship characteristics (e.g., greater obligatory rule endorsement in more committed relationships). Given the lack of previous research on rule endorsement, we pose further questions:

**RQ4:** Do females and males differ in endorsement of obligatory and discretionary rules?

**RQ5:** Are relationship characteristics (status, length, and degree of commitment) associated with endorsement of obligatory and discretionary rules?

The distinction between obligatory and discretionary rules has further implications for rule ambiguity. Obligatory rules specify expected behavior in clear terms, whereas discretionary rules require judgment regarding appropriate behavior and allow a range of behaviors rather than one in particular. In Cushman and Whiting’s (1972) terms, obligations have greater *rule specificity*. Cushman and Whiting (1972) speculated that understanding is more readily achieved with greater rule specificity. We recast this idea as a hypothesis for all three coorientation states.

**H3:** Agreement, perceived agreement, and understanding are greater for obligatory versus discretionary rules.
**Conflict over relationship rules**

Rule consensus is said to be an essential condition for interpersonal coordination, without which “chaos and frustration result” (Pearce, 1976, p. 25). This suggests that coorientation states should predict conflict. Indeed, a number of studies show a link between agreement and relational harmony (Acitelli et al., 2001). However, research on understanding is mixed (Cuperman et al., 2011; Fletcher & Kerr, 2010). Greater understanding is even associated with *disharmony* in some contexts, as understanding can reflect increased awareness of conflict-provoking beliefs of the partner (Sillars, 2011). Thus, we pose a hypothesis and question.

**H4:** Disagreement about honesty/deception rules is associated with relationship conflict.

**RQ6:** Is understanding of honesty/deception rules associated with relationship conflict?

Campbell, Simpson, Kashy, and Fletcher (2001) found that flexibility moderated impacts of ideal standards—when standards were more flexible, individuals remained positive even when the relationship did not live up to ideals. We consider whether an analogous principle applies to interpersonal perceptions of honesty/deception rules:

**RQ7:** Are interpersonal perceptions of less flexible rules (i.e., obligatory vs. discretionary rules) stronger predictors of relationship conflict?

**Methods**

**Identification of rules**

A prestudy identified honesty/deception rules used in the questionnaire for the main study. Initially, nine undergraduate students completed semistructured interviews lasting from 20 to 50 min. Participants were asked to identify and illustrate rules relating to honesty and deception in a current or previous romantic relationship, resulting in a preliminary list of 25 rules. These rules were then presented in a questionnaire to a separate group of 20 students, who wrote in additional rules that applied to their own romantic relationships. After eliminating redundant examples, this step expanded the list to 44 distinct rules.

The rules identified in the prestudy covered a variety of relational contexts. However, most rules were easily classified as either *obligatory* (e.g., “My partner should never lie to me under any circumstances”) or *discretionary* (e.g., “Sometimes it’s better not to share things that are just going to start a conflict”). To test the face validity of this distinction and screen for ambiguous items, five graduate students in communication read definitions of obligatory and discretionary rules and independently classified the rules. Across the five coders, agreement with the researcher’s classification ranged from 91 to 98%. The coding for one rule was switched, since coders’ judgments consistently differed from the researcher’s initial categorization. This resulted in 22 rules of each type (see Table 1). The balance in these categories was not by design; rather, the two rule types were equally prominent in participant descriptions.
Table 1. List of obligatory and discretionary rules.

<table>
<thead>
<tr>
<th>Obligatory rules</th>
<th>Discretionary rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>White lies are not ok between us.</td>
<td>What my partner shares with me is up to him/her, and that’s fine with me.</td>
</tr>
<tr>
<td>We should share everything about our relational history.</td>
<td>Sometimes it’s better not to share things that are just going to start a conflict.</td>
</tr>
<tr>
<td>We should be able to talk about the future of the relationship without lies.</td>
<td>Sharing genuine emotions is not necessary all the time.</td>
</tr>
<tr>
<td>Sexual history is important to share with each other.</td>
<td>Secrets are ok unless they will directly affect me (ex-health issues or future of the relationship).</td>
</tr>
<tr>
<td>My partner should tell me if he/she spends time with someone of the opposite sex.</td>
<td>Secrets are ok if disclosing them would bring harm to the self or partner, but they should definitely be disclosed if they could strengthen the relationship.</td>
</tr>
<tr>
<td>My partner should tell me if he/she is facing problems and vice versa.</td>
<td>Omitting details is ok if it is to avoid hurting my partner’s feelings or upsetting him/her.</td>
</tr>
<tr>
<td>My partner should keep me involved in his/her everyday activities to the point that I know where he/she is a majority of the time.</td>
<td>My partner is not obligated to tell me anything.</td>
</tr>
<tr>
<td>My partner should be honest with me about who is contacting him/her through media if I ever have questions.</td>
<td>My partner and I do not need to reveal everything to each other, but if prompted, we should.</td>
</tr>
<tr>
<td>My partner and I should voice our concerns about jealous feelings.</td>
<td>My partner and I can keep secrets from one another.</td>
</tr>
<tr>
<td>My partner and I should disclose where we are financially.</td>
<td>Just because my partner and I are able to contact each other all throughout the day (as afforded by technology), it does not mean that we should.</td>
</tr>
<tr>
<td>My partner and I should disclose everything to each other—nothing should be kept secret.</td>
<td>It’s ok to keep things private that are not damaging to the relationship.</td>
</tr>
<tr>
<td>My partner and I should disclose all details about when we “go out.”</td>
<td>It’s ok that we do not disclose everything about our past history to each other.</td>
</tr>
<tr>
<td>My partner and I should be honest with each other about needing time alone.</td>
<td>It’s important that my partner and I retain some independence.</td>
</tr>
<tr>
<td>My partner and I should be honest regarding feelings about the relationship itself.</td>
<td>It’s better to not share things that will provoke conflict if these things are not a big deal.</td>
</tr>
<tr>
<td>My partner and I should be genuine about emotions—good or bad.</td>
<td>It is ok to have secrets from each other, unless we directly ask one another about a particular topic—in which case we should disclose that information.</td>
</tr>
<tr>
<td>My partner and I must be exclusive.</td>
<td>If it is not affecting the relationship directly, I do not need to share it with my partner.</td>
</tr>
<tr>
<td>I think I should be able to know where my partner is at all times.</td>
<td>I do not need to know my partner’s sexual history.</td>
</tr>
</tbody>
</table>

(continued)
**Main study**

**Participants.** Participants and their romantic partners were recruited from undergraduate communication courses at a university in the northwest US. Participants received extra course credit. The sample was restricted to couples who had been dating 3 months or longer. Although there were two same-sex couples in the sample, the current report is limited to 73 heterosexual couples. Couples had been together an average of 47.7 months ($SD = 79.3$). Of them, 69% were dating exclusively, 3% dating casually, 6% were engaged, and 23% were married. Females were aged between 18 and 54 years ($M = 25.0$, $SD = 8.8$), and males were aged between 18 and 58 ($M = 26.4$, $SD = 9.3$). The sample was predominantly Caucasian (97% females and 92% males).

**Measurement.** Couples came to a room on campus at a prearranged time. After signing consent forms, individuals were directed to separate rooms to complete questionnaires. The first section of the questionnaire measured rule endorsement. After each honesty/deception rule, individuals indicated their agreement with the rule on 5-point Likert-type scales (“strongly disagree” to “strongly agree”). The next section measured rule meta-perspectives. Here, participants indicated whether they believed the partner would agree or disagree with each rule. Rule endorsement and meta-perspective items were used to calculate interpersonal perception scores, as explained below. In addition, summary scores for rule endorsement were computed based on average agreement with obligatory and discretionary rules. Discretionary rule endorsement, based on 22 items, had good reliability ($a = .87$ for females, .82 for males). One obligatory rule (“My partner is not allowed to check my personal stuff, such as text messages or my computer, without permission.”) negatively correlated with other items and was dropped from the analysis. The remaining 21 obligatory rules had acceptable reliability ($a = .81$ for females, .73 for males). As one might expect, obligatory rule endorsement correlated negatively with discretionary rule endorsement ($r = -.61$ for females, $-.55$ for males). However, the correlations were not so high as to suggest that the rules were strictly unidimensional. Conceptually, individuals might simultaneously endorse honesty while also acknowledging a need for discretion.

**Table 1. (continued)**

<table>
<thead>
<tr>
<th>Obligatory rules</th>
<th>Discretionary rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>I should know whom my partner is contacting through new media (texting, social networking, and e-mailing).</td>
<td>I do not need to know everything my partner is doing daily.</td>
</tr>
<tr>
<td>Health issues must be shared, regardless of the circumstances.</td>
<td>Family issues can be kept private from my partner.</td>
</tr>
<tr>
<td>Drug or alcohol use should be shared. Being direct with each other is necessary.</td>
<td>Distorting minor details is ok.</td>
</tr>
<tr>
<td>My partner is not allowed to check my personal stuff, such as text messages or my computer, without permission.</td>
<td>Distorting information is ok as long as it’s something inconsequential/minor.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Obligatory rules</th>
<th>Discretionary rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>I should know whom my partner is contacting through new media (texting, social networking, and e-mailing).</td>
<td>I do not need to know everything my partner is doing daily.</td>
</tr>
<tr>
<td>Health issues must be shared, regardless of the circumstances.</td>
<td>Family issues can be kept private from my partner.</td>
</tr>
<tr>
<td>Drug or alcohol use should be shared. Being direct with each other is necessary.</td>
<td>Distorting minor details is ok.</td>
</tr>
<tr>
<td>My partner is not allowed to check my personal stuff, such as text messages or my computer, without permission.</td>
<td>Distorting information is ok as long as it’s something inconsequential/minor.</td>
</tr>
</tbody>
</table>
**Relationship commitment** was measured by items from Rusbult, Martz, and Agnew (1998). Participants indicated agreement with six statements (e.g., “I am committed to maintaining my relationship with my partner”) on 9-point Likert-type scales (“not at all agree” to “agree completely”). The commitment index had adequate reliability (α = .75 for females, .88 for males). On average, individuals reported high commitment (M = 8.00 on a 9-point scale, SD = 1.20 for females, M = 7.64, SD = 1.58 for males). By comparison, relationship commitment averaged 7.18, 7.29, and 6.21 in three studies of undergraduate students by Rusbult et al. (1998). However, the students in those studies had been dating one week or more, as opposed to 3 months or more in the current study.

**Conflict** over honesty/deception was measured by five items that asked, “To what extent have you and your partner had disagreements that upset one or both of you about...” followed by five issues (keeping secrets, not sharing relevant information, honesty, deceptive behavior, and distorting the truth). The measure was modeled after a question used by Acitelli et al. (2001) to assess frequency of disagreements. Responses were recorded on 4-point Likert-type scales (“not at all” to “great extent”). The conflict index had good reliability (α = .84 for females, .88 for males). On average, individuals reported experiencing conflict over honesty/deception to a small extent (M = 1.87, SD = .77 for females, M = 1.92, SD = .81 for males).

Five items, adapted from Clatterbuck (1979), measured **attributional confidence**, which indicates general confidence in predicting another’s thoughts, emotions, and behaviors (e.g., “How accurate are you at predicting his/her attitudes?”). Attributional confidence was rated on a scale of 0–100%. Reliability was adequate (α = .76 for females, .85 for males). Overall, individuals expressed high attributional confidence (M = 87.9%, SD = 10.0 for females, M = 85.8%, SD = 10.7 for males).

**Analysis.** Interpersonal perception scores (agreement, perceived agreement, and understanding) were calculated based on within-dyad correlations and partial correlations between rule endorsement items and rule meta-perspectives (see Kenny et al., 2001). The correlation procedure eliminates some confounds that occur when difference scores are used to measure agreement and understanding (see Cronbach, 1955). In computing interpersonal perception scores, the 43 rules were treated as cases, such that correlations and partial correlations between direct and meta-perspectives were computed for each couple. The resulting correlations were then entered into the general data matrix as interpersonal perception scores. **Agreement** was calculated as the within-dyad correlation between rule endorsement scores for the two partners. **Perceived agreement** was the correlation between the same person’s rule endorsement and meta-perspective scores. **Raw understanding** was the correlation between a person’s meta-perspective and the partner’s rule endorsement.

As noted above, raw understanding is partly a function of projection and stereotyping. To control for projection, within-dyad partial correlations were computed between meta-perspectives and partner rule endorsement, controlling for the first person’s own rule endorsement. To control for stereotyping, within-dyad partial correlations controlled for the mean meta-perspective for that gender across all respondents (Kenny & Acitelli, 1994). **Differential understanding** was assessed by within-dyad partial correlations that controlled for both projection and stereotyping. Following
Michela’s (1990) recommendation for within-subject correlational designs, interpersonal perception scores were transformed to $z$ when performing statistical tests. In subsequent reporting, descriptive statistics for interpersonal perceptions reflect $r$ and partial $r$; whereas statistical tests are based on transformed scores.

### Results

#### Interpersonal perceptions

Table 2 reports descriptive statistics and $t$ tests comparing interpersonal perceptions of obligatory and discretionary rules. $RQ1$ asked about the extent of agreement, perceived agreement, and understanding on honesty/deception rules. As seen in Table 2, agreement, perceived agreement, and raw understanding were moderate overall, whereas differential understanding was quite low. $H1$ predicted that perceived agreement would exceed actual agreement. The hypothesis was confirmed for each gender and type of rule. Perceived agreement on obligatory rules exceeded actual agreement for females, $t(72) = 5.16$, $p < .001$, and males, $t(72) = 2.34$, $p < .05$. Perceived agreement on discretionary rules also exceeded actual agreement for females, $t(72) = 3.26$, $p < .01$, and males, $t(72) = 2.28$, $p < .05$. In support of $H2$, agreement generally exceeded understanding. Agreement on obligatory rules exceeded raw understanding for females, $t(72) = 1.87$, $p < .05$, and males, $t(72) = 4.40$, $p < .001$. Agreement on discretionary rules exceeded raw understanding for males only, $t(72) = 2.42$, $p < .05$.

Given the tendency to project self-beliefs to the partner, it follows that understanding scores should be conflated with agreement. Indeed, agreement correlated with raw understanding of obligatory rules ($r = .57$, $p < .001$ for females, .66, $p < .001$ for males) as well as of discretionary rules ($r = .37$, $p < .001$ for females, .34, $p < .01$ for males). The means in Table 2 suggest that (raw) understanding was largely a function of projection and stereotyping, since average scores for differential understanding were around zero.

#### Table 2. Interpersonal perception variables including all rules.

<table>
<thead>
<tr>
<th>Interpersonal perception variables</th>
<th>Obligatory rules</th>
<th>Discretionary rules</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agreement</td>
<td>.50 (.20)</td>
<td>.34 (.22)</td>
<td>4.70**</td>
</tr>
<tr>
<td>Female perceived agreement</td>
<td>.61 (.23)</td>
<td>.44 (.25)</td>
<td>6.03**</td>
</tr>
<tr>
<td>Male perceived agreement</td>
<td>.53 (.27)</td>
<td>.40 (.26)</td>
<td>3.60**</td>
</tr>
<tr>
<td>Female raw understanding</td>
<td>.45 (.21)</td>
<td>.32 (.22)</td>
<td>4.30**</td>
</tr>
<tr>
<td>Male raw understanding</td>
<td>.39 (.25)</td>
<td>.26 (.24)</td>
<td>3.41**</td>
</tr>
<tr>
<td>Female understanding (controlling for projection)</td>
<td>.24 (.30)</td>
<td>.27 (.23)</td>
<td>-.37</td>
</tr>
<tr>
<td>Male understanding (controlling for projection)</td>
<td>.14 (.25)</td>
<td>.14 (.25)</td>
<td>.03</td>
</tr>
<tr>
<td>Female understanding (controlling for stereotyping)</td>
<td>.03 (.31)</td>
<td>.00 (.25)</td>
<td>.41</td>
</tr>
<tr>
<td>Male understanding (controlling for stereotyping)</td>
<td>.14 (.28)</td>
<td>.03 (.26)</td>
<td>2.79</td>
</tr>
<tr>
<td>Female understanding (controlling for both)</td>
<td>-.02 (.30)</td>
<td>-.05 (.24)</td>
<td>.55</td>
</tr>
<tr>
<td>Male understanding (controlling for both)</td>
<td>.04 (.27)</td>
<td>-.03 (.27)</td>
<td>1.64</td>
</tr>
</tbody>
</table>

Note. $* *$ $t > .01$ (two-tailed) with Bonferroni correction for multiple comparisons. For $t$ tests, scores were transformed using Fisher’s $r$ to $z$. Mean and SDs reported in the table reflect nontransformed scores.
To further probe gender stereotyping about truth/deception rules, we examined summary meta-perspective scores (i.e., average rule endorsement attributed to the partner). Males attributed obligatory rule endorsement to females ($M = 3.89, SD = .51$) more than females attributed the same to males ($M = 3.68, SD = .42$), $t(72) = 3.02, p < .01$ (two-tailed). Conversely, females attributed discretionary rule endorsement to males ($M = 3.30, SD = .59$) more than males attributed the same to females ($M = 2.93, SD = .51$), $t(72) = 4.25, p < .001$ (two-tailed). These gender differences in meta-perspectives were consistent with actual differences in rule endorsement (see below), with one exception. Females saw males as endorsing discretionary rules to a greater extent than they actually did, $t(72) = 2.76, p < .01$ (two-tailed).

$H3$ predicted that agreement, perceived agreement, and understanding would be greater for obligatory rules versus discretionary rules. As seen in Table 2, $H3$ was supported for agreement, perceived agreement, and raw understanding but not differential understanding. The results suggest that the two types of rules differed primarily with respect to agreement (perceived and actual), since there was no difference in understanding after controlling for projection.

We computed correlations between attributional confidence and understanding scores to assess whether individuals had accurate meta-awareness of understanding ($RQ2$). There were no statistically significant correlations between confidence and either raw or differential understanding of obligatory and discretionary rules. Furthermore, understanding scores were modest by comparison to the high means for attributional confidence ($M = 88\%$ for females, $86\%$ for males). Thus, romantic partners expressed high confidence in knowledge of the other’s beliefs, but this confidence did not predict understanding of honesty/deception rules.

$RQ3$ asked whether relational involvement (as reflected in status, length, and commitment) is associated with agreement and understanding. The results suggest that involvement relates to perceived agreement but not actual agreement or differential understanding. Married and engaged males perceived greater agreement on discretionary rules ($M = .52$) than males in dating relationships ($M = .36$), $t(71) = 2.46, p < .05$ (two-tailed). Married/engaged males also perceived greater agreement on obligatory rules ($M = .62$) than males in dating relationships ($M = .50$), $t(71) = 1.80, p < .10$, although the effect was not significant. Similarly, relationship length (in months) correlated with male perceived agreement on obligatory rules ($r = .24, p < .05$; two-tailed). Commitment correlated with perceived agreement on obligatory rules ($r = .30, p < .05$) and discretionary rules ($r = .29, p < .05$) among males. Although commitment did not relate to agreement or understanding, commitment correlated with attributional confidence for both sexes ($r = .40$ for males, $.43$ for females, both $p < .01$). Thus, greater relational involvement seemed to convey the illusion of agreement for males and confidence for both sexes but did not predict actual agreement or understanding.

**Rule endorsement**

$RQ4$ asked whether males and females differ in endorsement of obligatory and discretionary rules. Both females and males endorsed obligatory rules more than discretionary rules. However, females endorsed obligatory rules ($M = 3.89, SD = .39$) more than...
males ($M = 3.77, SD = .33$), $t (72) = 2.20, p < .05$ (two-tailed), whereas males endorsed discretionary rules ($M = 3.11, SD = .44$) more than females ($M = 3.00, SD = .53$), $t (72) = 2.10, p < .05$ (two-tailed). In each case, average rule endorsement was at or above the theoretical midpoint of the 5-point scale, suggesting that rules of both types were seen in a favorable to neutral light overall. RQ5 asked whether relationship characteristics are associated with rule endorsement. Married or engaged females endorsed obligatory rules more than females in dating relationships, $t (71) = 2.11, p < .05$ (two-tailed). Relationship status did not affect male rule endorsement. Relationship length did not correlate with rule endorsement. However, relationship commitment correlated with endorsement of obligatory rules for both females ($r = .28, p < .05$) and males ($r = .29, p < .05$). Furthermore, commitment correlated negatively with endorsement of discretionary rules among females ($r = -.24, p < .05$). These results suggest that individuals tend to hold stronger and less flexible rules about truth telling in more committed relationships.

**Predictors of relationship conflict over honesty/deception**

Multilevel modeling was used to test associations between interpersonal perceptions and relationship conflict (H4, RQ6, and RQ7) while controlling for other variables. When performed with dyadic data, multilevel models can estimate the effects of both individual level (level 1) and dyadic level (level 2) variables, while accounting for independence of observations within dyads (see Kenny, Kashy, & Cook, 2006). Separate analyses were performed for interpersonal perceptions of obligatory and discretionary rules. Level 1 variables in each model included sex (coded $-1$: male, $1$: female), perceived agreement, and differential understanding. Level 2 variables included agreement and two control variables—relationship length and relationship status (coded $-1$: dating, $1$: engaged/married). The two control variables were included to eliminate possible confounds (e.g., perceived rule agreement could be greater and conflict less in more established relationships). Within-dyad variances for rule endorsement were also included to control another potential confound. When calculating within-dyad correlations, scores may be affected by restricted variances (Tiggle, Peters, Kelley, & Vincent, 1982). Restricted variances could represent a confound if resulting from socially desirable responses (e.g., a consistent pattern of very high rule endorsement and low conflict ratings).

To consider whether the effects of interpersonal perceptions differed for males and females, we initially included interactions between sex and the three interpersonal perception variables. Since this analysis was exploratory, the models were repeated retaining only main effects and significant interactions from the first stage. Model specification followed the two-intercept strategy (Kenny et al., 2006), which is useful for interpreting interactions. The models estimated a separate intercept for males and females and separate male and female slopes, where interactions were specified. The overall effects of sex and the interactions were estimated by specifying custom hypothesis tests using the SPSS software (see SPSS, Inc., n.d.). The covariance structure was specified as heterogeneous compound symmetry to allow for unequal variances from males and females. Interpersonal perception scores were centered for the analysis (Kenny & Acitelli, 2001).
Results indicated that interpersonal perceptions of obligatory, but not discretionary, rules predicted relationship conflict. Turning first to obligatory rules, the exploratory model identified a significant interaction of sex by perceived agreement ($p < .05$, two-tailed). Thus, the re-specified model (Table 3) included this interaction and all main effects aside from perceived agreement (the main effect being redundant with the female slope for perceived agreement).

As indicated in Table 3, there were no notable effects for control variables or gender but three significant associations between interpersonal perceptions and relationship conflict. $H4$ predicted disagreement would be associated with greater relationship conflict. In support, agreement on obligatory rules had a negative association with conflict, after controlling for other variables. Agreement on obligatory rules also had negative bivariate (Pearson’s) correlations with the reported conflict for both males, $r = -.45$, $p < .001$, and females, $r = -.33$, $p < .01$, one-tailed. $RQ6$ asked whether understanding is associated with conflict. Differential understanding showed the opposite pattern as agreement—greater understanding was associated with more conflict, after controlling for other variables. Bivariate associations between differential understanding and conflict were not statistically significant, $r = .09$, for males, .17, for females, $NS$, two-tailed. The significant interaction of sex by perceived agreement is clarified by separate slopes for males and females reported in Table 3. After controlling for other variables, perceived agreement was associated with lower conflict among males but not females. Similarly, bivariate correlations between perceived agreement and conflict were significant for males, $r = -.38$, $p < .01$, two-tailed, but not females, $r = -.06$, $NS$.

Turning to discretionary rules, the exploratory model revealed no significant interactions of sex by interpersonal perception variables. Thus, the re-specified model (Table 4) included only main effects. $RQ7$ asked whether interpersonal perceptions of obligatory or discretionary rules are stronger predictors of relationship conflict. Clearly, perceptions of obligatory rules were stronger predictors. As one can see from Table 4, interpersonal perceptions of discretionary rules had no notable associations with conflict.

### Table 3. Fixed effects of two-intercept multilevel model predicting relationship conflict from interpersonal perceptions of obligatory rules.

<table>
<thead>
<tr>
<th>Fixed effect</th>
<th>$B$</th>
<th>SE</th>
<th>df</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept—males</td>
<td>1.91</td>
<td>.10</td>
<td>76.59</td>
<td>19.98</td>
<td>.00</td>
</tr>
<tr>
<td>Intercept—Females</td>
<td>1.89</td>
<td>.10</td>
<td>75.23</td>
<td>19.60</td>
<td>.00</td>
</tr>
<tr>
<td>Gender</td>
<td>-.03</td>
<td>.10</td>
<td>72.19</td>
<td>-.29</td>
<td>.77</td>
</tr>
<tr>
<td>Relationship status</td>
<td>.05</td>
<td>.10</td>
<td>69.12</td>
<td>.53</td>
<td>.60</td>
</tr>
<tr>
<td>Relationship length</td>
<td>-.00</td>
<td>.00</td>
<td>67.81</td>
<td>-.80</td>
<td>.43</td>
</tr>
<tr>
<td>Rule endorsement variance</td>
<td>.09</td>
<td>.13</td>
<td>118.30</td>
<td>.68</td>
<td>.50</td>
</tr>
<tr>
<td>Agreement obligatory rules</td>
<td>-.10</td>
<td>.29</td>
<td>89.44</td>
<td>-3.73</td>
<td>.00</td>
</tr>
<tr>
<td>Differential understanding obligatory rules</td>
<td>.37</td>
<td>.18</td>
<td>114.86</td>
<td>2.09</td>
<td>.04</td>
</tr>
<tr>
<td>Male $\times$ perceived agreement</td>
<td>.69</td>
<td>.25</td>
<td>95.69</td>
<td>2.77</td>
<td>.01</td>
</tr>
<tr>
<td>Female $\times$ perceived agreement</td>
<td>-.42</td>
<td>.19</td>
<td>82.32</td>
<td>-2.19</td>
<td>.03</td>
</tr>
<tr>
<td>SE: standard error</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$SE$: standard error.

Roggensack and Sillars
While previous studies suggest that honesty is a prominent category of relationship rules (e.g., Baxter et al., 2001), the current study identifies distinctive qualities of honesty/deception rules that affect consensus and may contribute to couple conflict. The results have implications for work on information management, deception, and interpersonal perception. The implications reflect four themes: (1) the nature of rule sets, (2) coorientation over rules, (3) impacts on relationship conflict, and (4) gendered qualities of honesty/deception rules.

First, the descriptive qualities of rule sets illustrate paradoxical expectations for honesty. In the prestudy, individuals readily concretized beliefs about honesty through rules that applied to their own romantic relationships. The rules were wide ranging in content but mirrored Cushman and Whiting’s (1972) distinction between rules that require/prohibit versus permit actions, referred to here as obligatory versus discretionary rules. Although obligatory rules dictate expectations about necessary behavior (e.g., “We should share everything about our relational history”), discretionary rules allow judgment in response to situational contingencies (e.g., “distorting minor details is okay”). An equal number of rules from the prestudy fell into each category, suggesting that participants were cognizant of both. In the main study, couples endorsed obligatory rules more than discretionary rules; yet, means were at or above the theoretical midpoint of the scale for both rule sets. Thus, couples supported rules that require honesty and prohibit deception, while also allowing discretion. This practical paradox makes honesty/deception rules potentially problematic. Discretionary rules relinquish predictability over behavior; thus, what one person sees as deception may be something else to the other. Nonetheless, deception is likely to be treated as a significant transgression.

Second, the findings echo previous research on agreement and understanding in romantic relationships, adding insights specific to coorientation over communication rules. As predicted (H1 and H2), perceived agreement exceeded actual agreement and perceived and actual agreement exceeded understanding. Although intimate partners demonstrate both accuracy and bias in interpersonal perception, bias should assume a
greater role when the object of perception is more ambiguous, as in the case of honesty/deception rules. In answer to RQ1, agreement and raw understanding were in the moderate range; however, scores for differential understanding were around zero. Thus, couples showed negligible understanding of beliefs unique to the partner. Furthermore, couples demonstrated a lack of meta-knowledge concerning understanding. With respect to RQ2, individuals expressed high confidence in their ability to predict the partner’s beliefs (i.e., attributional confidence); however, confidence was not associated with understanding. These findings further confirm that intimate partners tend to express greater confidence in understanding of the other than warranted.

Differential understanding was calculated in a manner that controlled for projection (i.e., attributing one’s own beliefs to the partner) and stereotyping (attributing typical male or female beliefs to the partner). Since perceived agreement exceeded actual agreement, it follows that understanding scores dropped after controlling for projection. The results confirm that individuals use their own beliefs as a basis for assessing the partner’s perspective, even when there is actual disagreement. However, overreliance on sex-stereotypes seemed to be an even greater source of bias than projection among females. Female understanding scores remained in the moderate range after controlling for projection but dropped to around zero when controlling for stereotyping.

Another indicator of accuracy or bias, albeit an indirect one, is the association between relationship involvement and consensus on rules. Presumably, if people use all information available to them, they should clarify rules as relationships deepen and solidify over time. However, relationship characteristics did not predict agreement and understanding of rules (RQ3). On the other hand, relationship status and commitment did predict rule endorsement—individuals in more committed relationships endorsed obligatory rules to a greater extent (RQ5). Commitment was also associated with perceived agreement and attributional confidence. These observations add to the potential confusion surrounding honesty/deception rules—in more committed relationships, the partners adopt less flexible rules, assume greater agreement about these rules, and express greater confidence about the partner; yet, actual consensus is not greater than in less committed relationships.

The above findings mostly replicate observations of the previous interpersonal perception studies in a new context. One unique contribution of the current research is the focus on rule specificity. Obligatory rules identify appropriate behavior more specifically than discretionary rules. Following Cushman and Whiting (1972), we reasoned that rule specificity should affect consensus, as rules with greater specificity represent a less ambiguous target of perception. The resulting hypothesis (H3) was partially confirmed—couples had greater agreement, perceived agreement, and raw understanding on obligatory versus discretionary rules, but not greater differential understanding. It could be that the scores for differential understanding were too low to provide a sensitive test of the impacts of rule specificity. This relates to the ambiguity of both types of rules. The difficulty of coordinating honesty and deception rules is at least partially due to the fact that the rules (whether obligatory or discretionary) are not testable against external realities in the same way, say, that rules about spending may be tested by examining the partner’s checkbook. Thus, people may lack reliable feedback about the other’s perspective and, moreover, fail to check assumptions due to false confidence in knowledge of the partner.
Third, the results illustrated potential consequences of nonshared honesty/deception rules. In support of H4, agreement on obligatory rules was associated with lower conflict. By contrast, differential understanding was associated with greater conflict (RQ6). Although the direction of this association may appear counterintuitive, other studies report similar associations between understanding and relational disharmony in contexts, where interpersonal perceptions are conflict provoking (Sillars, 2011). In the current context, greater understanding may represent heightened recognition of tensions surrounding honesty/deception. Knowing that partner expectations do not align with one’s own could also cause conflict.

The low means for reported conflict indicate that honesty/deception rules were not a prominent source of conflict for most couples. Nonetheless, the results suggest significant potential for conflict, given that much disagreement remains latent (as indicated by low differential understanding and overestimation of agreement). In this sense, misunderstanding may buffer couples from conflict, at least in the short-term. If “ignorance is bliss” with respect to honesty/deception, it seems particularly so for males in our sample. Perceived agreement was associated with lower conflict for males (but not females) after controlling for actual agreement. However, false consensus over rules may create more intense conflict in the event that deception is uncovered. Many of the young adults studied by McCormack and Levine (1990) reported ending relationships upon discovering a lie.

Based on the research of Campbell et al. (2001), we considered whether consensus on obligatory versus discretionary rules might better predict conflict (RQ7). Campbell et al. (2001) found that the flexibility of ideal standards moderated the association between satisfaction of ideals and relationship quality. Similarly, agreement over more flexible (i.e., discretionary) rules was not associated with relationship conflict in the current study. Although couples agreed more on obligatory rules, these rules were a greater source of conflict in the absence of consensus.

Fourth, the results suggest that rule endorsement reflects gendered standards for openness (Afifi & Joseph, 2009) and, moreover, that couples use gender stereotypes as a basis for understanding the partner. In answer to RQ4, females endorsed obligatory rules to a greater extent than males, whereas males endorsed discretionary rules to a greater extent. The results support previous research suggesting that women are more likely than men to see deception as unacceptable behavior (Levine, McCormack, & Avery, 1992). Afifi and Joseph (2009) argue that unmet standards for openness can undermine commitment and satisfaction for women. Differences in specific rules for honesty/deception offer an example of how this might occur.

The results also suggest that individuals use gender stereotypes as a basis for predicting partner rule endorsement. This was particularly true for women in the sample, who appeared to rely more on stereotyping than projection for understanding the partner. Female understanding scores remained in the moderate range after controlling for projection but dropped to near zero after controlling for stereotypic accuracy. Predictions tied to gender stereotypes were mostly correct, with one exception—males did not endorse discretionary rules as much as females believed they would. Taken as a whole, these results suggest that gender stereotypes may convey valid information when that partner conforms to the stereotype (Acitelli et al., 2001) but can also mislead when one invokes the stereotype too strongly.
Limitations and future directions

The study assessed culturally based beliefs about honesty in a sample of mostly young couples in the US, so results might not extend to other populations. Although we would expect similar patterns to emerge with respect to interpersonal perceptions, future studies might explore how the content of rule sets differs by sample demographics and cultural orientations. Since the study was conducted in the US, beliefs about honesty and deception likely reflect strong independent self-construal, in which interaction goals favor directness for the sake of self-expression (Markus & Kitayama, 1991). Some studies indicate that collectivists have different motivations for deception than individualists (Aune & Waters, 1994) and are less likely to see indirect and evasive messages as deceptive in the first place (Lapinski & Levine, 2000; Yeung, Levine, & Nishiyama, 1999). Potentially, collectivists might endorse discretionary rules more than individualists or identify different contexts for obligatory and discretionary rules. Another issue for future research is the underlying basis of sex differences in rule endorsement. We found sex differences that could reflect broad differences in relational standards but might also reflect cultural characteristics of the sample or individual gender identities.

As noted, mean endorsement of both obligatory and discretionary rules was at or above the theoretical midpoint of the (5-point) scale. We take this as evidence that romantic couples often endorse both types of rules; however, the results could also reflect acquiescence bias. Since all rule endorsement items used positive wording and the same (“disagree–agree”) response options, mean scores for rule endorsement could be elevated due to a tendency to agree independent of item content. Another limitation of the rule endorsement items is posed by the sample. The items reflect spontaneously generated rules from participants in the prestudy. We cannot say whether these items represent typical rules in other socio-cultural groups. Moreover, we have suggested that romantic relationships provide a unique context; thus, we do not assume that the rule items apply to other relationship types. Finally, the sample size precluded use of large sample procedures, such as confirmatory factor analysis, to assess psychometric properties of the rule items, aside from internal consistency. Psychometric properties should be re-assessed in any follow-up research.

Conclusion

Rules theorists maintain that relationships are governed by implicit and explicit rules that promote coordinated action; however, rule consensus can be elusive when the rules are incomplete, nonspecific, or contradictory. Honesty/deception rules are particularly intriguing because the rules are taken quite seriously, despite having considerable ambiguity. Since perceived rules guide communication within relationships, exploring these rule sets should illuminate ways in which people attempt to create structure around complex relational territory. This research sheds light on varied definitions of honesty and deception, identifies sources of accuracy and bias affecting consensus on rules, and clarifies how agreement and understanding of rules may contribute to conflict.
Authors' note
This research is based on KER’s MA thesis as directed by the AS. A previous version of the article was presented at the 2012 National Communication Association convention in Phoenix.

Conflicts of interest
KER (University of Montana, 2011) is a doctoral student in Communication at the University of California, Santa Barbara. AS (University of Wisconsin, 1980) is a Professor of Communication at the University of Montana.

Acknowledgments
The authors wish to thank David Kenny and Jordan Soliz for their sage advice regarding statistical analyses.

Funding
This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

References


