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Development of the Brief Romantic Relationship Interaction Coding Scheme (BRRICS)

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Abstract

Although observational studies of romantic relationships are common, many existing coding schemes require considerable amounts of time and resources to implement. The current study presents a new coding scheme, the Brief Romantic Relationship Interaction Coding Scheme (BRRICS), designed to assess various aspects of romantic relationship both quickly and efficiently. The BRRICS consists of four individual coding dimensions assessing positive and negative affect in each member of the dyad, as well as four codes assessing specific components of the dyadic interaction (i.e., positive reciprocity, demand-withdraw pattern, negative reciprocity, and overall satisfaction). Concurrent associations with measures of marital adjustment and conflict were evaluated in a sample of 118 married couples participating in the Michigan State University Twin Registry. Couples were asked to discuss common conflicts in their marriage while being videotaped. Undergraduate coders used the BRRICS to rate these interactions. The BRRICS scales were correlated in expected directions with self-reports of marital adjustment, as well as children's perception of the severity and frequency of marital conflict. Based on these results, the BRRICS may be an efficient tool for researchers with large samples of observational data who are interested in coding global aspects of the relationship but do not have the resources to use labor intensive schemes.

Keywords

romantic relationships; coding scheme; marital adjustment

Various patterns of negative interactions between spouses have been found to be significant predictors of marital distress and discord (e.g., Birditt, Brown, Orbuch, & McIlvane, 2010; Gottman & Notarius, 2000). Indeed, negative or hostile interactions between spouses are correlated with mental health outcomes (e.g., Johnson & Jacob, 1997) as well as negative physical health outcomes (Kiecolt-Glaser et al., 2005; Kiecolt-Glaser & Newton, 2001). Likewise, research indicates that interparental interactions characterized by hostility, withdrawal, and stonewalling are associated with negative outcomes for children (e.g., Katz & Gottman, 1993; Katz & Woodin, 2003). For example, parents who interact with greater hostility and withdrawal with one another are more emotionally unavailable for their children (Sturge-Apple, Davies, & Cummings, 2006). In light of these findings, there is considerable interest in the study of marital interactions and marital adjustment from both clinicians and researchers in disciplines as diverse as sociology, child development, social psychology, and family psychology. Given the interest in marital interactions, the coding of

observed interactions is an important methodological concern in contemporary research involving the family.

A chief advantage of observational methods is that they add an objective component to the assessment of couple dynamics, given concerns over the limitations of self-report survey items. For example, the idea of sentiment override (Weiss, 1980) suggests that individuals interpret their partner's actions through either a generally positive or a generally negative perceptual filter, more or less regardless of the partner's objective behaviors. In other words, even when holding actual negative behaviors constant across couples, distressed couples may report more negative experiences than do nondistressed couples. Recent research has found that sentiment override often occurs in romantic relationships and it may be a marker of individual perceptions of the quality of their relationships (Cornelius, Alessi, & Shorey, 2007; Story et al., 2007). Moreover, wives may engage in sentiment override to a greater degree than husbands (Hawkins, Carrere, & Gottman, 2002). Given these findings, self-report methods may have certain limitations for assessing dyadic functioning.

The use of observational assessment strategies can help address these issues because they allow researchers to gather an important "third party" perspective on the relationship. Observational methods are also thought to have a high degree of ecological validity because they are often based on behaviors and affective expressions that occur when couples are asked to discuss problematic issues during tasks that are designed to resemble the kinds of discussions that occur in "real life." Given these advantages, it is no surprise that observed behaviors have been found to independently predict important future outcomes such as divorce and marital distress (Gottman & Notarius, 2000).

As it stands, there are a number of observational coding schemes designed to capture aspects of romantic relationships (see Kerig & Baucom, 2004). In general, there are two broad categories of coding schemes: microanalytic and macroanalytic (or "Gestalt"). Microanalytic coding schemes provide a large amount of specific information regarding the couple's relationship, whereas macroanalytic coding schemes are designed to capture key, global themes in couple dynamics. For example, a gestalt coding scheme may simply ask for overall ratings of a husband and wife's positivity, whereas a microanalytic coding scheme may ask coders to rate positivity on the smaller components such as laughter, affirmation statements, and eye contact.

Two common microanalytic coding schemes which provide very detailed information about the couples' verbal interaction patterns include the Marital Interaction Coding System (MICS; Hops, Wills, Patterson, & Weiss, 1972) and the Couple Interaction Coding System (CISS; Gottman, 1979). However, both require an intensive coding process (as much as 2 hr per video). Coding schemes such as the Rapid Marital Interaction Coding Scheme (RMICS; Heyman & Vivian, 1993) and the Marital Interaction Coding System "Ease" (MICSEASE; Griffin, Greene, & Decker-Haas, 2004) were designed to be shorter in length and therefore less time-consuming, but they still require a considerable amount of time and effort to implement. In the RMICS, for example, raters provide codes every time there is a change in the speaker. The Communication Skills Test (CST; Floyd & Markman, 1984) similarly involves coding during every speaker turn but the codes used are considered to be more global than in the RMICS. Given the many turns in typical conversations, coding each speaker turn requires intensive rater training. Indeed, it often takes as many as three months for a given coder to establish reliability.

Microanalytic coding schemes designed to assess nonverbal qualities of couple interaction patterns also present similar demands. The Specific Affect Coding System (SPAFF; Gottman, McCoy, Coan, & Collier, 1996), for example, is designed to assess emotion at a

nonverbal level (i.e., using facial, vocal, and cultural cues to attend to emotional expression) but requires significant time to establish reliability (i.e., nearly 120 hr per rater; Shapiro & Gottman, 2004). In addition, overall coding time is lengthy, because raters must watch each interaction three times. The Behavioral Affective Rating System (BARS; Johnson, Johns, Kitahara, Ono, & Bradbury, 1998) was designed to assess the same emotions as the SPAFF, but it uses a rating scale instead of a coding system. Specifically, the rating scale allows behaviors in the SPAFF to be coded using a Likert-type scale, which is a system very similar to macro-analytic coding schemes. In short, microanalytic coding schemes provide detailed information on the couples' interaction pattern, but they can also be lengthy and time-consuming

Macroanalytic coding schemes are designed to be shorter and simpler, and therefore alleviate many of the concerns with coder training and resource demands previously described. These schemes, however, are generally used less often than some of the microanalytic coding schemes listed above (see Heyman, 2001). Different global coding schemes vary in terms of the nature and number of relationship qualities that are assessed. For example, the Rapid Couple Interaction Scoring System (RCISS; Krokoff, Gottman, & Haas, 1989) requires coding of 22 behaviors, 13 of which are coded for the speaker and nine of which are coded for the listener at each turn of speech. Thus, although the number of codes is significantly reduced from its predecessor which consisted of 65 codes (the CISS), the RCISS is still rather intensive. The Marital Interaction Coding System–Global (MICS-G; Weiss & Tolman, 1990), by contrast, assesses six overarching communication patterns that are assessed on an overall Likert-type rating scale based on the frequency, intensity, and duration of a summary code. The MICS-G may be more efficient because it has fewer codes, but it still requires 10 hr of training and is generally only used by advanced clinicians. The System for Coding Interactions in Dyads (SCID; Malik & Lindahl, 2004) is unique in that it is more focused on global power and control dynamics within the relationship and thus may not be useful for researchers interested in overall positive and negative communication patterns. It also involves lengthy training, such that coders may have to spend up to 1 hr coding per interaction until they establish reliability. Once they are reliable, coders are still required to watch each interaction three times, which can take up to 45 min per interaction (Malik & Lindahl, 2004).

Perhaps the most frequently implemented global coding system is the Interaction Dimensions Coding System (IDCS; Julien, Markman, & Lindahl, 1989), which involves nine individual-level codes as well as five dyadic codes. Total coding time involves two passes of the interaction, plus about 5–10 min to assign final codes after the second pass. Training takes about 50 hr to complete (Kline et al., 2004). Thus, although the IDCS seems promising for researchers interested in global interactions, there is still a rather lengthy process involved in training raters. In addition, there are 24 dimensions that raters must keep in mind as they are watching the interactions (i.e., nine for each spouse and five overall), suggesting there is a need for an even simpler coding scheme.

In all, microanalytic coding schemes seem to be most promising for researchers interested in specific and detailed aspects of relationship quality (e.g., researchers who are using interaction data for clinical purposes). Indeed, Bakeman and Gottman (1997) argue that the inclusion of numerous categories in a coding scheme may overwhelm researchers with detail that is not needed, whereas “tightly focused coding schemes seem far more productive” (p. 16). Thus, for researchers with large sets of data for whom couple dynamics are only one of several interests, many of these existing coding schemes may be too complex and difficult to implement with limited resources for training coders. Therefore, there is a need for a coding scheme that is simple, straightforward, and can efficiently capture key, overarching dynamics in close relationships. Moreover, it would be ideal if such a scheme could be

implemented by volunteer undergraduate coders with limited training and backgrounds in couple's research. For these reasons, we developed the Brief Romantic Relationship Interaction Coding Scheme (BRRICS).

Common Constructs of Study in Close Relationships

A fundamental issue in the development of any coding scheme is the specific construct(s) under study. Ultimately we endorse the idea that researchers should focus on those constructs that are consistent with their research questions (Weiss & Heyman, 2004). For researchers studying general aspects of family relationships with limited time and resource constraints, it may be most efficient to evaluate a set of targeted, global constructs that provide an important overall sense of the functioning of that relationship. These global constructs can provide an observer-level glimpse into the couple's relationship. There are fortunately several key themes in the literature to guide this determination.

First, compared with nondistressed couples, distressed couples tend to communicate with greater levels of negative affect coupled with lower positive affect, and this pattern has been shown to predict relationship dissatisfaction and a greater chance for divorce (Baron et al., 2007; Caughlin, Huston, & Houts, 2000). Negative affect generally includes criticism, hostility, and harsh tones, whereas positive affect includes soothing voices, statements of empathy and understanding, and reflection. Thus, both negative and positive affect, as assessed in each partner and as a couple, seem to be key dimensions that should be captured by an efficient coding scheme.

Another important construct in the literature on marital relationships is the demand-withdraw pattern (Christensen & Heavey, 1990). This pattern occurs when one spouse avoids conflict while the other spouse approaches conflict. For example, one partner may attempt to talk about a problem in the relationship while the other partner avoids discussion and thereby withdraws from the interaction. The pattern has been consistently linked with relationship dissatisfaction (e.g., Christensen, Eldridge, Catta-Preta, Lim, & Santagata, 2006; Gottman & Levenson, 2000), and thus, it seems to be another important construct of interest.

Last, it would be important to capture a global rating of relationship quality. Indeed, the construct of overall relationship satisfaction is a key dependent variable in many studies and holds a special place in the literature (see Fincham & Beach, 2006). It may even subsume these other broad aspects of couple functioning. Indeed, it seems essential for many research purposes to obtain a global rating of relationship satisfaction from an outside perspective. Such a rating could be compared to self-report ratings of relationship satisfaction and global adjustment assessed through commonly used measures such as the Dyadic Adjustment Scale (Spanier, 1976) or the Marital Adjustment Test (Locke & Wallace, 1959).

The Current Study

The purpose of the current study is to present the BRRICS, which assesses eight global dimensions of couple functioning (see Table 1). This coding scheme was designed for researchers with large samples of observational data that do not have the resources to devote to extensive reliability training but still want to examine romantic relationship processes at the observational level. The BRRICS coding scheme was designed to permit researchers to extract meaningful "third party" information about couple relationships using coders with minimal training, such as undergraduate coders.

Method

Sample

The sample consisted of 118 married couples (total $N = 236$ participants) with twin children aged 6–10 years participating in the ongoing Twin Study of Behavioral and Emotional Development in Children (TBED-C), a study being conducted as part of the Michigan State University Twin Registry (Klump & Burt, 2006). The TBED-C will ultimately contain a sample of 1,000 families, of which we expect approximately 80–85% to have videotaped marital interaction data. Participants in the current study ranged in age from 26–59 years, with an average of 39.3 years ($SD = 5.3$) for wives and 40.1 year ($SD = 5.3$) for husbands. Couples had been married for an average of 15.1 years ($SD = 4.5$). The racial breakdown of the current sample was White (90%), African American (5%), Asian or Pacific Rim (1%), and other races (4%), proportions that are generally in keeping with those of the lower Michigan peninsula recruitment area (see Culbert, Breedlove, Burt, & Klump, 2008).

Participant Task

All procedures and materials for this study were approved by Michigan State University's Institutional Review Board. Each member of the couple was first asked to read through a list of potential spousal conflicts (e.g., money, childcare, sex, family time together, household chores) and circle the three they argue about most often. Spouses reporting they do not have disagreements with their partners ($n = 2$) were encouraged to circle the issues that they most commonly discussed with their spouse. Disagreements endorsed by both husband and wife were selected for discussion first, followed by disagreements from either husband or wife that were selected at random. In the latter case, effort was made to select disagreements that covered overlapping problem areas between husband and wife. The discussion of problem areas is a commonly used task in the study of marital interactions (see Kerig & Baucom, 2004). For the purposes of the current study, couples were asked to discuss these problems using instructions that were designed to be consistent with other family interactions within the larger TBED-C study.

Couples were then asked to sit together in a room decorated to resemble a living room and discuss three preselected disagreements for a total of 10 min. The research assistants offered them the prompt, "We selected some cards based on your choices from the Spousal Disagreement form and we'd like you to spend some time discussing the conflicts on these cards. Please follow the instructions on the cards." On each disagreement card, the couple was first asked "What is it about [*spending time with children*] that causes conflict or disagreements?" They were then asked, "Discuss your thoughts and feelings about this conflict or disagreement, with the goal of attempting to resolve the conflict. You may or may not resolve the conflict during this discussion, but discuss the problem area like you are trying to resolve it. If you are satisfied that you have done all you can to resolve this conflict or disagreement (even if it still has not been fully resolved), please go on to the next card." Once they completed one area (either because they came to a resolution or because they could not resolve the conflict and wanted to move on), they were told to discuss an additional area of disagreement until the time was up. Interactions were monitored from a separate room to ensure participants remained on task. Couples were given additional conflicts they had circled if they finished the first three within the 10 min. If they finished all of their selected topics, they were asked to discuss recent conflicts (a rare occurrence).

Content for BRRICS

The descriptions of the eight constructs selected for coding are listed in Table 1. Codes for individual-level Positive Affect and Negative Affect were based in part on similar scales in the R-MICS (Heyman & Vivian, 1993). Positive Affect encompasses behaviors such as

smiling, laughing, joking, expressing care and concern, and offering statements of understanding to the other spouse, whereas Negative Affect includes harsh tones or facial expressions, hostility, and criticism. For each of these two codes, raters were asked to tally the number of times positive or negative behaviors occurred in the interaction, while also monitoring the overall time spent engaging in positive or negative behaviors by each individual during the entire 10-min interaction. Importantly, the tallies were meant to establish the frequency of the behavior while also gauging overall time of the behavior to select a final rating. Raters were told that after three tallies of the behavior (i.e., a rating of “3”), they need not be exact with tallies but should attend more closely to the overall time involved (as tallying at this point would require multiple viewings of the interaction). Each group of behaviors was then rated using an overall or global indication of frequency (1 = “Never,” 2 = “1–2 instances,” 3 = “A few/several instances,” 4 = “Moderate amounts—about half the time,” 5 = Substantial amounts—over half the time but not the entire time,” 6 = “Constantly throughout the interaction”). This particular rating scale is a modification of the rating scales used in the Parent-Child Interaction Coding System (Deater-Deckard, Pylas, & Petrill, 1997; the coding scheme used for the parent–child interactions within the TBED-C).

Positive Reciprocity was designed to approximate shared positive affect at the level of the dyad, whereas Negative Reciprocity was designed to measure shared negative affect. As is the case with the individual-level ratings, coders provided overall ratings of frequency and time using the same scale for both of these codes. Importantly, these constructs were coded whenever one partner exhibited positive (or negative) behavior and the other partner responded in kind. If the pattern of positivity (or negativity) continued between the partners, coders were told to attend to the relative time spent by the couple engaging in such a back-and-forth manner. For the Demand-Withdraw pattern, raters were asked to code “Yes,” “Somewhat,” or “No” for the presence, slight presence, or absence of the demand-withdraw pattern, respectively. For the Overall Satisfaction code, raters indicated the extent to which they perceived that the couple was satisfied and happy with their relationship using a 5-point scale (1 = “Extremely Low,” 2 = “Low,” 3 = “Neither High nor Low,” 4 = “High,” 5 = “Extremely High”).

Criterion-Related Validity Measures

The Dyadic Adjustment Scale (DAS; Spanier, 1976) was used to assess self-reported ratings of marital adjustment. Each member of the couple was asked to complete the questionnaire during the remainder of the TBED-C assessment. Of the 236 participants, only three (1.3%) were missing self-report data on marital adjustment. The current study made use of an extension of the DAS that was originally used as part of the Minnesota Twin Family Study (see Humbad, Donnellan, Iacono, & Burt, 2010) in which two additional items were added to the original 32-item scale to assess spousal agreement regarding parenting (i.e., how to raise the children and how to discipline the children). These items were added because conflicts over child rearing play a known role in marital satisfaction (e.g., Cui & Donnellan, 2009). The DAS measures four dimensions of marital adjustment: marital satisfaction, consensus, cohesion, and affective expression, as well as an overall measure of marital adjustment (the sum of the four dimensions). In the current sample, the four subscales had an average correlation of $r = .48$ for husbands and wives, suggesting that the subscales are tapping correlated attributes of the relationship. We therefore used the overall measure of marital adjustment because previous work suggests that the composite has stronger associations with other variables than do the individual subscales (Graham, Liu, & Jeziorski, 2006). We examined husband and wife reports separately (both $\alpha = .95$) as well as when they were averaged together.

To obtain a separate informant report of the marital relationship, the 48-item Children's Perception of Interparental Conflict Scale (CPIC; Grych, Seid, & Fincham, 1992) was also included. Each twin was asked to complete the CPIC under the supervision of a research assistant. If the child was unable to read at the expected reading level of a 10-year-old child, the research assistant was asked to read the questions and record responses from the child. We made use of two subscales of the CPIC, as identified by Nigg et al. (2009): Conflict Frequency, a 5-item measure of the child's perception of the frequency of interparental conflict; and Conflict Severity, an 8-item measure of the child's perception of the severity of interparental conflict. These scales are designed to measure perceptions of observed interparental conflict in the home, and can thus serve as additional measures of relationship distress and conflict. The two remaining CPIC scales (i.e., Self-Blame and Perceived Threat) were not examined because they are designed to assess the child's emotional and/or cognitive appraisals of the interparental conflict (e.g., I am to blame when my parents argue) rather than their perception of the actual level of conflict in the home (Nikolas, Friderici, Waldman, Jernigan, & Nigg, 2010). Each twin completed the CPIC, yielding two reports per family. Twin reports were therefore averaged for each family (resulting in one overall twin report per family). Although the intraclass correlations between twins suggested small agreement in their reports (i.e., $r = .20$ for Conflict Frequency and $.24$ for Conflict Severity), the pattern of results was largely the same when using each twin's report separately (results available upon request). CPIC data was missing for 5 of the 236 twins (2%), but data were never missing for both twins within a twin pair. Internal consistency reliabilities were $.61$ for Conflict Frequency, $.68$ for Conflict Severity, and $.71$ overall across both scales.

Coder Training and Reliability

Four undergraduate coders (50% women), with little to no prior experience in the area of relationship research and no prior experience coding observational data, were selected to rate the interactions. The first author first met with all coders for 1 hr to describe the coding scheme and to explain each of the individual codes. During this meeting, coders and the first author watched an interaction together for one pass and discussed possible ratings for each code. Following this meeting, coders were asked to independently watch and code five interactions. Coders were asked to watch each interaction twice. During the first pass, they were asked to specifically attend to each individual separately and rate each of the four individual-level codes (i.e., Positive and Negative Affect for husband and wife). During the second pass, they were asked to attend to the couple as a dyad and rate the four dyadic-level codes. Thus, for each interaction, raters watched the interaction for 20 min total and spent less than 5 min rating the couple, resulting in roughly 25 min of rater time per interaction.

Reliability for these first five videos, as initially indexed using the Pearson correlation coefficient, was calculated to be $.65$ across all eight codes and all four coders using PRAM software (i.e., a Program for Reliability Assessment with Multiple Coders; Skymeg Software, 2004). The first author then met with coders again for 1 hr to discuss any problems encountered during the first set of five videos and to answer any questions. In addition, the coded videos and their respective ratings were discussed, and coders as well as the first author came to a verbal consensus on how the videos should have been coded. Coders were then assigned another set of five videos. The reliability for this new set of five videos across all eight codes and four coders was higher ($r = .85$). Thus, after only 2 hr of training and 2.5 hr of watching videos, undergraduate coders had achieved adequate levels of consistency. All four undergraduate raters then coded the remaining 108 videos, after which they recoded the original five interactions. In all, 118 interactions were coded by all four coders.

Intraclass correlations (ICCs) were computed across raters for final reliability purposes. Using SPSS 19.0, a two-way mixed effects ICC using absolute agreement was calculated for

each of the eight scales across all four coders (following McGraw & Wong, 1996). Interrater reliabilities as assessed using these ICCs are presented in Table 1. Given that there was very low endorsement for “Somewhat” and “Yes” for the demand/withdraw item at the dyadic level (i.e., roughly 11% of videos were coded as “Somewhat” or “Yes” for this scale), we chose to collapse these ratings into a single category for the presence of any degree of the demand/withdraw pattern. Because this item became categorical (i.e., 0 = Absence, 1 = Presence), Cohen’s Kappa was calculated between each coder pair and then averaged across coder pairs for reliability purposes. Importantly, Kappa values of at least 0.60 are considered good (Landis & Koch, 1977), and generally ICCs greater than 0.70 are considered acceptable (see, e.g., Labreton, Burgess, Kaiser, Atchley, & James, 2003). As seen in Table 1, ICCs ranged from 0.60 – 0.82, suggesting adequate interrater consistency across all BRRICS codes.

Data Analyses

We first examined bivariate correlations between each of our BRRICS codes and marital adjustment and children’s perception of interparental conflict. Next, we evaluated whether husband and wife individual-level codes were associated with their own marital adjustment or their partner’s marital adjustment using the Actor-Partner Interdependence Model (APIM; Kenny, Kashy, & Cook, 2006). This statistical model is ideal because it accounts for the interdependence inherent in dyadic data while also providing estimates of both actor effects (i.e., the association between an individual’s own characteristics and his or her own marital adjustment) and partner effects (i.e., the association between an individual’s own characteristics and his or her partner’s marital adjustment). Analyses were conducted using the AMOS 19.0 structural equation modeling package. Specifically, we examined associations between the individual-level codes of Positive Affect and Negative Affect for husbands and wives and marital adjustment for both husbands and wives. Before analyses, the individual-level codes were centered following Kenny et al.’s recommendations.

Results and Discussion

Descriptive Data

Table 2 presents means, *SDs*, modes, and ranges for all eight BRRICS codes. Because Demand-Withdraw was a binary variable, the percentage of the couples coded for this pattern is presented (i.e., this pattern was evident in 11% of our sample observations). As seen in the table, there was generally a low rating of BRRICS codes representing negative behaviors (i.e., Husband and Wife Negative Affect, Negative Reciprocity, and Demand-Withdraw), suggesting there may be a low base rate of negative behavior in our sample. The rating of Positive Affect was significantly higher than the rating of Negative Affect in both wives and husbands, $t(117) = 13.1, p < .05$ for wives and $t(117) = 14.5, p < .05$ for husbands). In addition, Positive Reciprocity was rated to a higher degree than Negative Reciprocity, $t(117) = 11.7, p < .05$. Importantly, however, positive behavior was still only primarily rated “A few/several instances” within the interaction by our coders.

Results of BRRICS Codes

To evaluate whether the BRRICS codes were associated with other measures of the marital relationship, we first randomly selected one coder from each interaction for analysis. We elected to use this strategy instead of averaging ratings across all four coders, because we intend to have only one coder rate future interactions and thus will not be averaging their reports. However, we also conducted correlational analyses using the average of all four coder reports. Results were highly similar to those for the randomly selected coder, and in no case did they change our conclusions (table available upon request; no absolute

difference in correlation exceeded $|.10|$ except for the correlation between husband negative affect and wife marital adjustment which was a $.11$ difference).

We then examined the intercorrelations across the eight BRRICS codes. As seen in Table 2, the BRRICS scales were correlated with each other in the expected direction, such that codes reflecting positive attributes were correlated positively with one another and correlated negatively with codes reflecting negative attributes. Correlations ranged from medium to large in magnitude (i.e., $r = .29$ to $.82$), suggesting many of the codes were possibly tapping into overarching global negative and positive dimensions. Because of these large intercorrelations, we conducted an exploratory factor analysis using a promax rotation for seven of the eight codes. We did not include the Demand-Withdraw code in this factor analysis given that it was coded dichotomously (as opposed to using a Likert scale like the other codes) and was generally rated as absent in our sample. Two eigenvalues were above 1.0 (4.6 and 1.2) and the first two factors explained 82% of the variance. Codes that loaded primarily onto the first component (i.e., loadings $> .5$) included Positive Affect for husbands and wives, Positive Reciprocity, and Overall Satisfaction. Codes that loaded primarily onto the second component (i.e., loadings $> .5$) included Negative Affect for husbands and wives and Negative Reciprocity. These results were consistent with the notion that there are overarching global positive and negative dimensions. We therefore summed the codes that comprised each of these two factors to provide us with an overall indicator of Relationship Positivity and Relationship Negativity. The overarching composites were negatively correlated with one another ($r = -.60$). For comparison purposes, we also summed Relationship Positivity with reverse scored Relationship Negativity for an indicator of Overall Relationship Quality. For subsequent correlational analyses, we examined associations between the individual codes as well as these composites in relation to our outcomes.

BRRICS Codes and Marital Adjustment

We next correlated each of the BRRICS codes as well as the overarching composites with spousal reports of marital adjustment as assessed via the DAS. These correlations are presented in Table 3, and ranged from $r = .30$ to $.67$, suggesting moderate to large associations between the BRRICS codes and marital adjustment. The positive BRRICS codes (i.e., Positive Affect, Positive Reciprocity, and Overall Satisfaction) were positively associated with marital adjustment as was the broad Relationship Positivity composite and Overall Relationship Quality composite. The negative BRRICS codes (including Relationship Negativity) were negatively associated with marital adjustment. The Overall Relationship Quality composite was strongly related to the average overall marital adjustment (i.e., $r = .56$), suggesting that this overall dimension seems to capture much of what is measured by the DAS.

We then used the APIM to evaluate the statistical associations of the individual-level codes (Positive and Negative Affect) and marital adjustment. These results should be viewed with some caution given the present sample size and the general expectation that partner effects are considerably smaller than actor effects in most empirical research (see Ackerman, Donnellan, & Kashy, 2011). We first used the omnibus test of distinguishability (following procedures outlined in Kenny et al., 2006) to test whether husbands and wives were statistically distinguishable within the dyad. This test evaluates whether men and women differ in their means, variances, and covariances for the relevant variables, and it identifies whether the APIM should be specified for distinguishable as opposed to indistinguishable dyads (see Ackerman et al., 2011). In these data, there was evidence of distinguishability for Positive Affect and marital adjustment (chi-square = 15.9, $df = 6$, $p < .05$) and for Negative Affect and marital adjustment (chi-square = 23.7, $df = 6$, $p < .05$). Given the outcome of these tests, we used the APIM for distinguishable dyads for all analyses. For the

distinguishable model, given that we could not constrain means, variances, and covariances to be equal across husbands and wives, we used a fully saturated APIM model (i.e., $df = 0$).

Results of the APIM analyses are presented in Table 4. As seen there, there was only evidence for an actor affect for wives' own Positive Affect when statistically predicting marital adjustment (the effect was not statistically significant for husbands). Second, wives' own Negative Affect had both actor and partner effects for predicting marital adjustment. For husbands, the only significant effect was the actor effect for marital adjustment. In summary, the individual-level BRRICS codes are associated with marital adjustment as assessed by the DAS, though there seems to be indications that the associations are greater for wives than husbands.

BRRICS Codes and CPIC

Given that twins also reported on their parents, we were able to examine whether the BRRICS scales were also associated with other informant reports of the marital relationship. As seen in Table 3, both Conflict Severity and Conflict Frequency had small to moderate correlations with the BRRICS scales. These scales were related a small to moderate degree with marital adjustment (i.e., $rs = -.25$ and $-.46$ for Conflict Severity and Conflict Frequency, respectively, both $ps < .05$). Given that these two scales together demonstrated good reliability ($\alpha = .71$), we summed the scales for a composite measure of children's perceptions of interparental conflict. As seen in the last column of Table 3, this composite was correlated more strongly with the BRRICS codes than the individual CPIC scales. Such findings further highlight the concurrent associations of the BRRICS.

The Relationship Positivity and Relationship Negativity constructs were also related in the expected direction to Conflict Severity, Conflict Frequency, and the composite CPIC measure, suggesting that children's perceptions of interparental conflict are consistent with observer ratings of positive and negative qualities of the marital relationship. There were a few sex differences that might warrant further inquiry. At the individual-level, wife Positive Affect was significantly associated with child-reported Conflict Frequency in a negative direction, and wife Negative Affect was positively associated with both child-reported Conflict Severity and Frequency. This pattern of results applied to ratings of husband positive and negative affect, but those associations were not statistically significant. Thus, perhaps wives' behavior is more likely to be associated with overall level of conflict in the relationship as reported by children. This finding is consistent with previous literature suggesting that wives in general are more willing to express negativity and more willing to engage in and escalate conflict in observational studies (e.g., Gottman & Levenson, 1986). We should acknowledge, however, that mean differences in positive and negative affect across husbands and wives were quite small in these data ($d = .07$ for positive affect and $d = .08$ for negative affect, with positive numbers indicating that wives were higher), suggesting that wives were only rated slightly more negatively than husbands. Thus, it will be important to evaluate whether these apparent gender differences in the connection between BRRICS codes and relationship outcomes are robust.

Conclusions, Limitations, and Future Directions

The goal of the current study was to conduct an initial evaluation of a new global coding system, the BRRICS. The BRRICS was designed to measure a small set of targeted constructs that are commonly discussed in the literature and could provide an overall impression of the functioning of the dyadic relationship. Overall, it seems as if observers were able to identify patterns of negativity and positivity based on a 10-min interaction with a fairly high degree of reliability. This level of interrater consistency was relatively easy to achieve given the time involved in training coders. Perhaps more importantly, the BRRICS

observations were reasonably consistent with self-reports of the DAS and child perceptions of conflict in the interparental relationship. In other words, the BRRICS scales appear to display concurrent associations with informant-report measures of the marital relationship from both the married partners and their children. We thus conclude that the BRRICS is a promising and easy-to-implement coding scheme for those interested in globally coding observations of romantic relationships.

The BRRICS was specifically intended for use by researchers who collect large amounts of family data but who may not have resources and time to devote to coding marital interactions at a microanalytic level. Indeed, we believe this coding scheme might be particularly useful to researchers who are planning large scale research but who are considering eschewing observational methods altogether because of resource concerns. Such a decision is understandable given that the existing coding schemes might not be the most optimal or efficient use of the project resources in many cases. However, observational data is immensely useful and therefore the BRRICS should fill an important gap. As stated earlier, the TBED-C sample will eventually consist of 1,000 families, about 80 – 85% of which should have marital interactions. We expect that the observational data obtained from this sample will be particularly valuable and provide an important complement to survey-based measures.

Despite our enthusiasm for the BRRICS, there are some limitations that should be noted. First, the significant inter-correlations between our codes suggested that they are not tapping independent dimensions. However, this finding is not uncommon among measures of the marital relationship. Indeed, subscales on the DAS were correlated in our sample (i.e., $r = .48$), suggesting that this self-report measure also taps similar constructs. Given this issue of correlated codes, we conducted a subsequent exploratory factor analysis that indicated the codes could be more parsimoniously grouped into global Relationship Positivity and Relationship Negativity dimensions. We also created an Overall Relationship Quality composite which also demonstrated significant associations with marital adjustment. We recommend that future researchers interested in using the BRRICS examine these codes individually as well as create aggregates for the overall dimensions so that it will be possible to empirically evaluate whether anything is lost by aggregating all codes into a single composite.

In addition to these concerns, we used a somewhat limited suite of variables for examining associations with the coding scheme. Because our data comes from a larger study in which the primary focus is not the marital relationship, we did not have additional marital outcome measures. Future research should therefore investigate additional variables (e.g., marital stability) and self-report measures to assess convergent validity for the BRRICS codes (e.g., questionnaires assessing positive and negative communication, demand-withdraw patterns). Moreover, should we have access to the couple's marital status 5 or 10 years from now, we could assess whether the BRRICS independently predicts additional outcomes such as divorce. We suspect that because the BRRICS is associated with commonly used spousal and child reports of the marital relationship, it should be associated with outcomes such as divorce.

A final limitation is that the present sample consisted primarily of White, heterosexual couples who have at least two children, and have been married for an average of 15 years. These sample characteristics may well have contributed to the relatively low levels of negative affect we observed in the data (i.e., perhaps these couples are more satisfied given they are in relatively long-term, stable relationships with at least two children). Perhaps more importantly, the demographics of this sample mean that we cannot confidently generalize our findings to individuals in other ethnic groups or in same-sex marriages.

Despite these caveats, qualifications, and need for future study, we suggest that the BRRICS is a useful tool for quantifying the quality of couple interactions at a global level. The BRRICS has obvious utility for large scale research projects but it might also be useful for therapists who need a quick screening instrument for determining couple distress. Indeed, we suspect that the brevity and efficiency of the BRRICS will prove useful to a diverse range of researchers and even clinicians interested in obtaining a third-party perspective on the overarching themes present in observed couple interactions.

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Table 1**Item Descriptions and Inter-Rater Reliabilities for BRRICS Items**

Code	ICC	Description
Wife Positive Affect	0.80	Smiling, laughing, humorous statements, and statements that make the partner feel understood and validated. Examples: outright jokes of the "one liner variety," proposals that are clearly facetious solutions to the problem, statements emphasizing the humorous aspects of a situation or problem, paraphrasing the partner's statements, reflecting feelings, giving positive feedback, and expressing care, concern, or understanding of the person's feelings. Does NOT include nervous laughter or smiling, or humor with a sarcastic or hostile undertone.
Wife Negative Affect	0.81	Any instance of a harsh tone or facial expression. Includes statements with negative content including criticism, nonverbal responses that communicate hostility, and disagreements said with harsh tone that do not further the discussion.
Husband Positive Affect	0.73	Same as Wife Positive Affect
Husband Negative Affect	0.76	Same as Wife Negative Affect
Positive Reciprocity	0.73	Overall positivity and warmth in the couple. Code for smiling, laughing, and joking with each other (but do not code for hostile humor).
Negative Reciprocity	0.81	Code for hostility, harsh tone, frowning, and/or criticism towards each other.
Demand-Withdraw Pattern ^a	0.60	This is a characteristic pattern in which one partner "nags" the other partner who then withdraws (or "shuts down") from the interaction. In this pattern, one partner will continue to voice complaints, push the other partner to do something, or criticize the other partner while the other partner withdraws from the conversation and stops responding in an appropriate fashion. Often times, the withdrawal of one partner will make the demanding partner become even more demanding. Code to what degree this pattern is present. This pattern is often gendered such that women make the demands while men withdraw, but the reverse may also be found.
Overall Satisfaction	0.82	Rate how much you feel this couple is satisfied and happy with their marriage to one another.

Note. Descriptions were given to coders to rate the different dimensions. Four undergraduate coders rated each of the above categories across 118 couple interactions.

^aFor the Demand/Withdraw Pattern, the ICC computed is identical to Cohen's Kappa statistic calculated across multiple raters.

Table 2

Descriptive Statistics and Correlations Between BRRICS Codes

	Mean (SD)	Mode	Range	1	2	3	4	5	6	7	8
1. Wife Positive Affect	3.6 (1.0)	3	1-6	—	-.49	.77	-.42	.79	-.43	-.37	.72
2. Wife Negative Affect	1.6 (.9)	1	1-5	—	—	-.34	.62	-.46	.82	.52	-.70
3. Husband Positive Affect	3.5 (1.0)	3	1-6	—	—	—	-.45	.80	-.43	-.29	.60
4. Husband Negative Affect	1.5 (.8)	1	1-4	—	—	—	—	-.47	.78	.34	-.59
5. Positive Reciprocity	3.2 (1.2)	3	1-6	—	—	—	—	—	-.44	-.34	.73
6. Negative Reciprocity	1.4 (.8)	1	1-5	—	—	—	—	—	—	.38	-.58
7. Demand-Withdraw ^a	11%	0	0-1	—	—	—	—	—	—	—	-.52
8. Overall satisfaction	3.5 (1.0)	4	1-5	—	—	—	—	—	—	—	—

Note. $N = 118$ couples. All r s were significant at $p < .01$. Wife and Husband Positive Affect, Wife and Husband Negative Affect, Positive Reciprocity and Negative Reciprocity were rated using an overall or global indication of frequency (1 = "Never," 2 = "1-2 instances," 3 = "A few/several instances," 4 = "Moderate amounts—about half the time," 5 = Substantial amounts—over half the time but not the entire time," 6 = "Constantly throughout the interaction").

^aDemand-Withdraw was rated using a binary scheme to capture the absence ("0") or presence ("1") of the pattern, and as such, the percentage of couples demonstrating the pattern is indicated rather than the mean and standard deviation. Overall Satisfaction was rated using a 5-point scale (1 = "Extremely Low," 2 = "Low," 3 = "Neither High nor Low," 4 = "High," 5 = "Extremely High").

Table 3
Correlations Between BRRICS Codes, Marital Adjustment, and Children's Perception of Interparental Conflict

	Wife DAS	Husband DAS	Average DAS	CPIC conflict severity	CPIC conflict frequency	CPIC combined
Wife Positive Affect	.40**	.34**	.40**	-.13	-.20*	-.21*
Wife Negative Affect	-.67**	-.39**	-.59**	.20*	.32**	.33**
Husband Positive Affect	.30**	.30**	.30**	-.16	-.16	-.20*
Husband Negative Affect	-.41**	-.37**	.40**	.11	.09	.12
Positive Reciprocity	.43**	.33**	-.41**	-.13	-.23*	-.22*
Negative Reciprocity	-.57**	-.43**	-.54**	.19*	.27**	.29**
Demand-Withdraw	-.34**	-.31**	-.38**	.05	.10	.10
Overall Satisfaction	.54**	.43**	.52**	-.19*	-.27**	-.29**
Global composites						
Relationship Positivity	.47**	.39**	.46**	-.17	-.24**	-.26**
Relationship Negativity	-.62**	-.44**	-.57**	.19*	.26**	.28**
Overall Relationship Quality	.58**	.46**	.56**	-.20*	-.27**	-.29**

Note. $N = 118$ couples. DAS represents Dyadic Adjustment Scale. CPIC represents Children's Perception of Interparental Conflict Scale. CPIC Combined is operationalized as the sum of CPIC Conflict Severity and CPIC Conflict Frequency. Relationship Positivity is operationalized as the sum of Husband and Wife individual Positive Affect, Positive Reciprocity and Overall Satisfaction. Relationship Negativity is operationalized as the sum of Husband and Wife individual Negative Affect and Negative Reciprocity. Overall Relationship Quality is operationalized as the sum of Relationship Positivity and reverse-scored Relationship Negativity.

* $p < .05$.

** $p < .01$.

Table 4

Actor-Partner Interdependence Model Results of Individual BRRICS Codes With Marital Adjustment

BRRICS Code	Path estimates			
	a _w	p _w	a _h	p _h
Positive Affect	8.9 [*]	4.1	2.1	-.75
Negative Affect	-15.3 [*]	-4.5 [*]	-5.2 [*]	.18

Note. $N = 118$ couples. Unstandardized path coefficients reported. We fit the distinguishable or fully saturated model (i.e., $df = 0$), which allowed a and p effect to vary across husbands (h) and wives (w).

^{*}
 $p < .05$.