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(Dis)similarity in Impulsivity and Marital Satisfaction: A Comparison of Volatility, Compatibility, and Incompatibility Hypotheses

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Abstract

Impulsivity is negatively associated with relationship satisfaction, but whether relationship functioning is harmed or helped when both partners are high in impulsivity is unclear. The influence of impulsivity might be exacerbated (the Volatility Hypothesis) or reversed (the Compatibility Hypothesis). Alternatively, discrepancies in impulsivity might be particularly problematic (the Incompatibility Hypothesis). Behavioral and self-report measures of impulsivity were collected from a community sample of couples. Mixed effect polynomial regressions with response surface analysis provide evidence in favor of both the Compatibility Hypothesis and the Incompatibility Hypothesis, but not the Volatility Hypothesis. Mediation analyses suggest results

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for satisfaction are driven by perceptions of the partner's negative behavior and responsiveness. Implications for the study of both impulsivity and relationship functioning are discussed.

Claire and Phil are both impulsive. Phil generally acts without considering consequences; Claire acts rashly when angry or upset. As a couple, they experience dramatic conflicts because neither person thinks before speaking and both are reluctant to admit fault. Research examining self-control in the context of close relationships suggests their marriage will suffer (see Luchies, Finkel, & Fitzsimons, 2011, for a review). Yet, previous research has shown that greater compatibility is associated with greater correspondence of goals and preferences, minimizing the risks inherent in relationships (see Murray & Holmes, 2009; 2011, for reviews). To the extent that partners who match on impulsivity are more compatible, Claire and Phil may experience better marital outcomes than they would if only one of them were impulsive. The current research compares these two perspectives to determine whether concordance for impulsivity detracts from or enhances marital satisfaction.

Impulsivity as a Relationship Risk Factor

Impulsivity is frequently used as a defining characteristic for psychological disorders in the Diagnostic and Statistical Manual of Mental Disorders 5 (APA, 2013). For example, impulsive behaviors are included as key symptoms in diagnoses of impulse control disorders, mood disorders, personality disorders, substance use disorders, and paraphilias. Impulsive behaviors like excessive spending, sexual promiscuity, gambling, poor anger control, and substance abuse seem particularly likely to detract from relationship satisfaction. Indeed, trait impulsivity in one partner is negatively associated with the relationship satisfaction and stability of both partners (Kelly & Conley, 1987; Robins, Caspi, & Moffitt, 2000; Stroud, Durbin, Saigal, & Knobloch-Fedders, 2010).

There are at least two pathways by which impulsivity may detract from relationship satisfaction: 1) negative partner behavior and 2) perceived partner responsiveness. First, impulsivity is associated with greater and more frequent *negative behavior* and fewer pro-relationship behaviors (Luchies et al., 2011). For example, greater impulsivity (assessed behaviorally) is associated with being less polite (von Hippel & Gonsalkorale, 2005), with being less forgiving of a close other's offenses (Pronk, Karremans, Overbeek, Vermulst, & Wigboldus, 2010), and with greater extra-dyadic flirtation (Pronk, Karremans, & Wigboldus, 2011). Similarly, greater impulsivity (assessed through self-report measures of self-control) is associated with less accommodation to a partner's behavior (Finkel & Campbell, 2001), with less perspective-taking and more family conflict (Tangney, Baumeister, & Boone, 2004), and with greater intimate partner violence (Finkel, DeWall, Slotter, Oaten, & Foshee, 2009). Thus, Phil's greater level of impulsivity, assessed through behavioral tasks or self-report questionnaires, should lead Claire to report that he has behaved more negatively and that she is less satisfied with the relationship.

The second pathway by which impulsivity may detract from marital satisfaction is through the influence of *perceived partner responsiveness*.[1] The perception that the partner is likely to be responsive to one's needs is critically dependent on the belief that the partner

understands, approves of, and supports the self (Holmes & Rempel, 1989; Kelley, 1979; Murray & Holmes, 2011; Murray et al., 2009; Tooby & Cosmides, 1996). To the extent that more impulsive people act rashly without thinking through consequences, they may be less likely or even less able to take their partner's preferences into account. Accordingly, they may regularly act in their own best interest, leaving their partner with less evidence that it is safe to trust in their likely responsiveness (Holmes & Rempel, 1989; Murray & Holmes, 2011; Murray et al., 2009). When the partner has (or is perceived to have) low self-control (i.e., is high in impulsivity), people perceive lower partner responsiveness (Gomillion, Lamarche, Murray, & Harris, 2014; Righetti & Finkenauer, 2011). In turn, lower perceived partner responsiveness predicts lower relationship satisfaction and stability (Derrick et al., 2012; Murray et al., 2000).

Compatibility as a Protective Factor?

Phil's greater impulsivity should predict Phil's more negative relationship behaviors (Pronk et al., 2011), Claire's lower perceived partner responsiveness (Gomillion et al., 2014), and Claire's lower relationship satisfaction (Stroud et al., 2010). Yet, it is unclear whether these previous findings would generalize to relationships in which both partners are impulsive. It is possible that two highly impulsive people would enact the same impulsive behaviors, thus exacerbating the destructive consequences for the relationship. This possibility is supported by research demonstrating a positive association between relationship partners' total score on self-control and relationship outcomes. In a set of three studies examining friends, dating partners, and newlyweds, the more total self-control (i.e., the less total impulsivity) the partners reported, the more positively the relationship functioned (Vohs, Finkenauer, & Baumeister, 2011). In those studies, however, self-control was assessed using only one self-report measure that combines two factors of impulsivity (i.e., disinhibition and inattention, see below), and the data were not analyzed using dyadic techniques (e.g., Kenny, Kashy, & Cook, 2006). Other studies using dyadic analysis and traits related to self-control/impulsivity have not found that discrepancies/similarity predict satisfaction (Dyrenforth, Kashy, Donnellan, & Lucas, 2010; Robins et al., 2000). Thus, replicating the general findings of Vohs et al. (2011) using different measures of impulsivity and different analytic techniques would allow for greater confidence in the strength and generalizability of the effect.

Alternatively, it is possible that two highly impulsive people would be buffered against the negative effects of impulsivity on their relationship. Greater similarity, even on such “undesirable” traits as neuroticism, attachment anxiety, and attachment avoidance, is associated with greater marital satisfaction (Bentler & Newcomb, 1978; Kurdek, 1991; Luo & Klohnen, 2005; but see Dyrenforth et al., 2010; Robins et al., 2000). This may be the case in part because partners who are more similar are more compatible and experience fewer or more tractable conflicts of interest, leading to fewer experiences of negative partner

[1]The belief that one is loved and will be cared for has been referred to variously as felt security (Mikulincer & Shaver, 2003; Murray, Holmes, & Griffin, 2000), trust (Holmes & Rempel, 1989; Murray & Holmes, 2009, 2011; Righetti & Finkenauer, 2011), perceived regard (Derrick, Leonard, & Homish, 2012; Murray, Bellavia, Rose, & Griffin, 2003), perceived acceptance and love (Derrick & Murray, 2007), and perceived partner responsiveness (Derrick, Leonard, & Homish, 2013; Reis & Shaver, 1988). For clarity, we use the term perceived partner responsiveness throughout the current paper.

behavior. Furthermore, merely perceiving that one's partner is similar to the self (regardless of whether or not it is actually the case) leads to greater feelings of being understood and greater relationship satisfaction (Montoya, Horton, & Kirchner, 2008; Murray, Holmes, Bellavia, Griffin, & Dolderman, 2002). Partners who are actually similar may interpret each other's thoughts and behavior more accurately, allowing both partners to feel better understood and increasing perceived partner responsiveness (e.g., Laurenceau, Barrett, & Pietromonaco, 1998; Reis & Shaver, 1988). Therefore, couples composed of partners who are more similar in terms of impulsivity might experience better relationship functioning than couples composed of partners who are more dissimilar.

Defining Impulsivity

Conceptual models and measurement of impulsivity differ greatly across studies, especially between behavioral and self-report research traditions (see Cyders & Coskunpinar, 2011; Dick et al., 2010; Duckworth & Kern, 2011; Evenden, 1999; Sharma, Markon, & Clark, 2013, for reviews). Correlations between measures within the behavioral tradition are typically low, even for tasks that purportedly assess the same factors (Dick et al., 2010; Duckworth & Kern, 2011). Conversely, correlations between measures within the self-report tradition are generally moderate, even for questionnaires that purportedly tap different factors (Duckworth & Kern, 2011; Reynolds, Ortengren, Richards, & de Wit, 2006). Behavioral and self-report assessments rarely overlap (Buchanan, in press; Cyders & Coskunpinar, 2011; Duckworth & Kern, 2011; Reynolds et al., 2006). Although several research groups have attempted to sort these measures into assessments of different factors on both conceptual and empirical grounds (e.g., Cyders & Coskunpinar, 2011; Dick et al., 2010; Dougherty et al., 2009; Miyake & Friedman, 2012; Reynolds et al., 2006; Sharma et al., 2013; Whiteside & Lynam, 2001), controversy remains. The approach we take in the current study is to identify conceptually those measures that appear to tap the factor of interest. We focus primarily on the factor of disinhibition but examine other factors as a test of discriminant validity.

Disinhibition refers to the failure to inhibit an automatic, dominant, or learned response in favor of a more adaptive or better planned response. When assessed behaviorally, disinhibition is typically measured using tasks that require participants to attend selectively to target stimuli while inhibiting a prepotent response, like on the Go/No-Go Task (Newman & Kosson, 1986), the Stop Signal Task (Logan, 1994), and the Go-Stop Task (Dougherty, Mathias, Marsh, & Jagar, 2005). When assessed using self-report, disinhibition is generally presented within a (lack of) deliberation, premeditation, or planning framework. People who self-report being relatively more disinhibited tend to act without forethought and without tempering or constraining their behavior (Dick et al., 2010; Sharma et al., 2013; Whiteside & Lynam, 2001). In a recent meta-analytic factor analysis (Sharma et al., 2013), the Go/No-Go Task and the Stop Signal Task loaded heavily on a behavioral (dis)inhibition factor (though both cross-loaded on additional factors). Most “traditional” questionnaire measures of impulsivity loaded on a self-report disinhibition vs. constraint factor. Thus, there is general consensus (both conceptually and empirically) that disinhibition is one (and perhaps the primary) factor driving impulsive behavior, both within the behavioral and the self-

report research traditions. Accordingly, we focus on assessments of disinhibition as our primary assessments of impulsivity.

Discriminant Validity

The data for the current manuscript were drawn from a larger study involving executive function, impulsivity, and self-control, so we were in a position to examine the consequences of matching on impulsivity using three additional proposed factors: (in)attention, cognitive (in)flexibility, and working memory. *Inattention* refers to the inability to sustain focus in the face of distracting stimuli. When assessed behaviorally, inattention is generally measured using continuous performance tasks that require participants to attend selectively to target stimuli while ignoring distractors (Cyders & Coskunpinar, 2011; Dick et al., 2010; Dougherty et al., 2009; Sharma et al., 2013). When assessed using self-report, the attention—inattention factor is generally presented within a (lack of) perseverance or willpower framework. People who self-report being relatively more inattentive are unable to tolerate boredom or persist in the face of distraction or obstacles (Dick et al., 2010; Sharma et al., 2013; Whiteside & Lynam, 2001). In the meta-analytic factor analysis (Sharma et al., 2013), the Stroop Task (Stroop, 1935) loaded entirely on a behavioral (in)attention factor. Scales tapping variations of conscientiousness, willpower, or perseverance loaded on a self-report conscientiousness/will vs. resourcelessness factor. Although we expected to find different results for inattention than for disinhibition, we had no a priori hypotheses regarding the direction of effects.

Tasks assessing *cognitive inflexibility* require participants to switch or shift between different sets of instructions or responses. *Working memory* tasks require participants to demonstrate recall after a short delay, often with distractors. Despite their occasional use in the self-control/impulsivity research area, cognitive inflexibility and working memory tasks are more frequently used to tap components of executive function (Miyake & Friedman, 2012; Sharma et al., 2013). Impulsivity and executive function are generally considered separate research areas, but many executive function tasks include components that are typically used in impulsivity assessments (e.g., disinhibition, inattention). Among the behavioral tasks analyzed in the meta-analytic factor analysis (Sharma et al., 2013), “shifting” or cognitive (in)flexibility, emerged as its own factor. Working memory tasks were not included, and no self-report questionnaires purported to assess cognitive (in)flexibility or working memory were included.[2] Although we expected to find different results for cognitive inflexibility and working memory (hereafter, executive dysfunction) than for disinhibition, we had no a priori hypotheses regarding the direction of effects.

Overview and Hypotheses

In the current study, we investigated the association between disinhibition and relationship functioning in a community sample of married and long-term cohabiting couples using mixed effect polynomial regressions and response surface analysis (RSA; Edwards, 2002;

[2]Although behavioral research often includes a delay of gratification/delay discounting component (Dick et al., 2010; Duckworth & Kern, 2011; Sharma et al., 2013), no tasks assessing delay of gratification or delay discounting were included in the larger study from which the current data are drawn.

Nestler, Grimm, & Schönbrodt, 2015; Shanock, Baran, Gentry, Pattison, & Heggestad, 2010). Although it is common to examine compatibility in couples using difference scores, total scores, or multiplicative interactions (e.g., Dyrenforth et al., 2010; Robins et al., 2000; Robinson & Cameron, 2012; Vohs et al., 2011), such methods are limited in the amount of information they can provide. RSA involves modeling the associations between three variables in a three-dimensional space, thus providing a more complete picture of variables' interrelationships. Additionally, it is possible to directly test hypotheses regarding the associations between similarity (i.e., comparisons to the "line of perfect agreement" or the "line of congruence") or dissimilarity (i.e., comparisons to the "line of incongruence") and the outcome. In the current study, we pitted three hypotheses against each other regarding the effects of matching (or mismatching) on impulsivity.

Volatility hypothesis

Two highly disinhibited partners might enact the detrimental behaviors described in previous research on impulsive individuals, exacerbating the negative consequences of disinhibition for the relationship (i.e., "matching" produces a synergistic effect). Therefore, we might expect to observe a negative linear association between the *line of congruence* and relationship functioning. As both partners' disinhibition increases, actors would report more frequent negative partner behavior and lower partner responsiveness, resulting in lower relationship satisfaction. In other words, the surface area in which both partners are highly disinhibited would demonstrate the poorest relationship functioning.

Compatibility hypothesis

Two highly disinhibited partners might be more compatible. Accordingly, they might experience fewer conflicts of interest and feel more understood, reversing the negative consequences of disinhibition on the relationship. Therefore, we might expect to see a curvilinear association between the line of congruence and relationship functioning. Greater similarity between actor and partner disinhibition, whether both low or both high, would lead actors to report less frequent negative partner behavior (i.e., a concave surface) and greater partner responsiveness (i.e., a convex surface), resulting in greater relationship satisfaction (i.e., another convex surface). In other words, the surface areas in which partners are "matched" on disinhibition (i.e., both low or both high) would demonstrate better relationship functioning than the response areas in which the partners are "mismatched."

Incompatibility hypothesis

In the first two hypotheses, we proposed "movement" in the concordant surface areas—that is, that matching on disinhibition would lead to certain effects, either negative or positive. It is also possible that the "movement" occurs in the discrepant surface areas—that is, that *mismatching* on disinhibition would lead to *poorer* outcomes. Using most strategies for testing similarity effects, we would not be able to distinguish between the Compatibility and Incompatibility Hypotheses. However, it is possible to test these two hypotheses separately using RSA. Whereas the Compatibility Hypothesis would be tested by examining curvilinear associations with the line of *congruence*, the Incompatibility Hypothesis would be tested by examining curvilinear associations with the line of *incongruence*. Specifically,

we might expect to see a curvilinear association between the line of incongruence and relationship functioning. Greater dissimilarity between actor and partner disinhibition would lead actors to report more frequent negative partner behavior (i.e., a convex surface) and lower partner responsiveness (i.e., a concave surface), resulting in lower relationship satisfaction (i.e., another concave surface).[3]

Method

Participants

Data for the current analyses were taken from the first wave of a longitudinal study of alcohol use, executive function, and intimate partner violence. Married or long-term cohabiting heterosexual couples (n = 280 couples, or 560 individuals) from the community participated in the first wave of the study and received 100 USD per couple for participating. Men averaged 36.9 (*SD* = 5.8) and women averaged 35.4 (*SD* = 5.9) years of age. The majority of men and women in the sample were White (91% each). They were fairly well-educated (58% of men and 67 % of women had completed college education) and most were employed at least part-time (91% of men and 80% of women). The majority of couples were married (85%) as opposed to cohabiting. The average total relationship length was 10.29 years (SD = 5.17). Approximately 79% of the sample had children. Among those with children, 15% had one child, 38% had two, 19% had three, and 7.5% had more than three. Median income for men was in the $40,000-$54,999 range, and median income for women was in the $20,000-$29,999 range.

Screening and Recruitment

Participant couples were recruited from the community via a targeted mailed survey (Dillman, Smyth, & Christian, 2007; Homish & Leonard, 2009). We purchased a list of addresses, which was developed primarily from phone listings but was supplemented with other database information, from a commercial survey company (Survey Sampling International, Shelton, CT). The list was composed of households in Erie County, New York, the United States, that were likely to contain a married couple. We mailed 21,000 screening questionnaires to addresses on this list. A one dollar incentive and stamped return envelope were included with the questionnaire (Dillman et al., 2007; Homish & Leonard, 2009). We received 5463 responses for a 26% response rate (226 or about 1% were returned due to an incorrect address). Of the 5463 responses, 7.6% were African-American, and 3.1% were other minorities. Using data from the 2005-2009 American Community Survey conducted by the U.S. Census Bureau, we calculated that among currently married couples (including those living together as married) in Erie County, 90% are White, and 6% are African-American. Thus, our response rate closely mirrored the population of married couples with respect to racial characteristics.

[3]A significant linear association would indicate that the direction of the discrepancy matters. For example, a negative linear association between the line of incongruence and perceived partner responsiveness would indicate that actors who are more disinhibited than their partner report lower partner responsiveness. We had no reason to expect that the direction of the discrepancy would matter.

The purpose of the mailed questionnaire was to assess eligibility criteria and to determine husband and wife "heavy episodic drinking" status. Couples were eligible if they were married or had been living together as married for at least one year, both partners were between the ages of 18 and 45, and, due to the study focus on executive function, neither partner had a current medical condition that would impair neurocognitive functioning. In order to ensure adequate numbers of husbands and wives who met criteria for heavy episodic drinking, we utilized disproportionate sampling to recruit couples into four groups in which the husband, wife, both, or neither qualified as heavy episodic drinkers. Heavy episodic drinking was defined as having an episode at least once a week in the past year in which the participant consumed 5 drinks at one time (4 drinks for women; Wechsler, Dowdall, Davenport, & Rimm, 1995) or became intoxicated (Homish & Leonard, 2005).

Of the 5463 responses, 3477 met eligibility criteria. Of those meeting eligibility criteria, neither partner qualified as a heavy episodic drinker in 75% of the couples, only the husband qualified in 12.3% of the couples, only the wife qualified in 4.1% of the couples, and both partners qualified in 8.5% of the couples. Across the groups, 68% were interested in participating. Surprisingly, the proportion of those who were interested was significantly higher for couples in which only the husband (72%), only the wife (74%), and both partners (76%) qualified as heavy episodic drinkers than for couples in which neither partner qualified (67%), $\chi^2(3) = 16.32$, $p < .01$. We sampled from the four groups at different rates in order to achieve the goal of 75 couples per group. This stratified sampling was done by design and has implications for our data analyses (i.e., data must be weighted). We were able to recruit 80 couples in which neither partner qualified as a heavy episodic drinker, 80 in which only the husband qualified, 79 in which both partners qualified, and, due to their lower prevalence, 41 couples in which only the wife qualified. We achieved a 43% success rate from those who we attempted to recruit, a rate that did not differ across the 4 groups, $\chi^2(3) = 2.78$, $p > .40$.

Procedure

Participants provided informed consent to participate in the research. They completed a series of questionnaires through the mail and attended a laboratory assessment. Mailed questionnaires included measures of demographics, personality, and attitudes. At the laboratory assessment, couples completed a series of neurocognitive and behavioral tasks; computerized questionnaires assessing alcohol and drug use, relationship functioning, and partner aggression; and a conflict interview. In the current analyses, we use self-report assessments of negative partner behavior, perceived partner responsiveness, and relationship satisfaction as our outcome variables. We evaluate evidence comparing the Volatility, Compatibility, and Incompatibility Hypotheses using both behavioral and self-report assessments of disinhibition as our primary predictors. We test discriminant validity by evaluating the same hypotheses using assessments of inattention (behavioral and self-report), cognitive inflexibility (behavioral and self-report), and working memory (behavioral) as alternate predictors. We include demographic information and both actor and partner past-year quantity and frequency of alcohol use as control variables in all analyses.

Outcomes: Assessments of Relationship Functioning

Negative Partner Behavior—An adapted version of the 18-item Test of Negative Social Exchange (TENSE; Ruehlman & Karoly, 1991) was used to assess perceptions of the partner's negative behavior (α = .92 [husbands] and .93 [wives]). The scale captured perceived hostility/impatience (e.g., “My partner lost his or her temper with me”), insensitivity (e.g., “My partner ignored my wishes or needs”), interference (e.g., “My partner distracted me when I was doing something important), and ridicule (e.g., “My partner made fun of me”). Participants responded on a frequency scale from 1 (not at all) to 5 (about every day). Responses were averaged to create the final score, with higher scores indicating more frequent negative behavior.

Perceived Partner Responsiveness—We used the six-item emotional intimacy subscale of the Personal Assessment of Intimacy in Relationships (PAIR; Schaefer & Olson, 1981) to assess perceived partner responsiveness (α = .82 [husbands] and .88 [wives]). The items in this subscale capture perceptions of the partner's emotional availability (e.g., “I often feel distant from my partner” [reversed]), understanding (e.g., “My partner can really understand my hurts and joys”), and responsiveness (e.g., “My partner listens to me when I need someone to talk to”). Participants answered on a scale from 1 (strongly disagree) to 5 (strongly agree). Responses were averaged to create the final score, with higher scores indicating greater perceived partner responsiveness.

Relationship Satisfaction—Relationship satisfaction was assessed using the Dyadic Adjustment Scale (DAS; Spanier, 1976), a widely used 32-item measure (α = .92 [husbands] and .94 [wives]). Example items include “How often do you discuss or have you considered divorce, separation, or terminating your relationship?” (reversed); “In general, how often do you think that things between you and your partner are going well?”; “How often do you and your partner quarrel?” (reversed). Items were summed to create a total score, with higher scores reflecting greater satisfaction. Husbands averaged 112.08 (*SD* = 14.67, range: 37 – 151) and wives averaged 112.38 (*SD* = 16.57, range: 43 – 145). Approximately 21% of both husbands and wives reported satisfaction scores below the threshold of 100, indicating probable relationship distress.

Predictors: Behavioral Tasks

Trail Making Test (TMT)—The TMT (Lezak, Howieson, & Loring, 2004) consists of parts A and B. In the **TMT-A**, the participant must draw a line connecting a series of numbers in sequential order. This task is primarily an assessment of attention and motor speed. The primary outcome measure is the length of time in seconds to complete the task, with higher scores indicating greater inattention and/or poorer motor speed. The **TMT-B** is similar to the TMT-A except that it requires the participant to alternate between numbers and letters. Beyond attention and motor speed, this task assesses the ability to inhibit responding and cognitive flexibility. The primary outcome measure is the length of time in seconds to complete the task. Because scores on the TMT-B reflect the operation of several processes, many researchers partial out the attention/motor speed component by subtracting the TMT-A score from the TMT-B score (see Duckworth & Kern, 2011, for a review). In

the current study, higher values on this difference score (**TMT-Diff**) reflect greater disinhibition and cognitive inflexibility.

GoStop Task—In the GoStop Task (Dougherty et al., 2005), number stimuli are presented in black text on a computer screen for 500 ms. In half of the trials, a target "go" stimulus is presented (matching stimuli requiring a response), and in half of the trials, a filler "no-go" stimulus is presented (non-matching stimuli). Additionally, half of the target trials become "stop" trials; participants are signaled to withhold a response (the black stimuli turn red) 50ms, 150ms, 250ms, or 350ms after the stimulus appears. In our task, participants completed two blocks of trials, for a total of 160 no-go trials, 80 go trials, and 80 stop trials.

We used two scores from this task as measures of disinhibition (Cyders & Coskunpinar, 2011; Dick et al., 2010; Dougherty et al., 2009; Sharma et al., 2013). First, we used the primary measure from the GoStop Task, the ratio of the number of response inhibition failures (i.e., incorrect responding on the "stop" trials) to the number of correct responses to "go" trials, as a measure of inability to inhibit an already initiated response. In the current study, ratios for the 50ms, 150ms, 250ms, and 350ms stop trials were highly correlated (all *r*s > .61, all *p*s < .001), so we combined them to create one **GoStop Ratio** score (α = .91 [husbands] and .88 [wives]). Second, we used the number of errors on the filler trials (i.e., **No-Go Errors**). This component of the GoStop Task is essentially the same as the Go/No Go Task and assesses participants' ability to inhibit a prepotent response.

Stroop Color-Word Task—The Stroop Task (Stroop, 1935) assesses attentional control and the ability to resist distraction (Cyders & Coskunpinar, 2011; Sharma et al., 2013). The manual administration consists of three parts: Word, Color, and Color-Word. For each part, participants are presented with a page of 100 stimuli (25 × 4) and asked to say aloud as many color names as they can in 45 seconds. In the Word condition, participants are asked to read color names that are printed in black ink. In the Color condition, participants are asked to name the color of ink in which a row of four "Xs" are printed. In the Color-Word condition, participants are presented with color names printed in colored ink and, like in the Color condition, are asked to name the color of ink (rather than read the word). An interference score for the Color-Word condition was calculated based on the number of correct responses according to the procedures outlined in Golden and Freshwater (2002). Scores were reversed so that higher scores reflect greater inattention.

Wisconsin Card Sorting Task (WCST)—The WCST (Heaton, Chelune, Talley, Kay, & Curtis, 1993) is a measure of cognitive flexibility, switching, or shifting (Duckworth & Kern, 2011; Miyake & Friedman, 2012; Sharma et al., 2013). The participant is presented with one card printed with 1 of 4 symbols (triangle, star, cross, or circle) in one of four colors (red, green, yellow, or blue). The participant is asked to match each card to one of the four stimulus cards according to a principle that must be deduced from the interviewer's response to each placement. Each time 10 consecutive matches are made, the matching principle changes without notifying the participant. The primary measures for this task are **Perseverative Errors** (continuing to use the same categories after the matching principle has changed) and **Non-Perseverative Errors** (errors that are not consistent with a previous principle).

WAIS-III Digit Span—The Digit Span (The Psychological Corporation, 1999) is a test of working memory. A sequence of digits (one per second) is read to the participant. The participant is asked to repeat the digits back. The number of digits increases with successful trials. In the Digit Span Backward condition, the participant is asked to repeat the sequence in the reverse order. The number of successful trials on the Digit Span Backward was summed and reversed to create the final scores, with higher scores reflecting **poorer working memory**.

Predictors: Self-Report Assessments

Brief Self-Control Scale (BSCS)—The 13-item BSCS (Tangney et al., 2004) assesses self-reported ability to exert self-control (α = .77 [husbands] and .81 [wives]). Example items include "I am good at resisting temptation"; "I refuse things that are bad for me." Participants responded on a 1 (not at all) to 5 (very much) scale. Recent research suggests that the BSCS is not a unidimensional scale (Maloney, Grawitch, & Barber, 2012); rather, it can be divided into two separate 4-item subscales. The subscale labeled "impulsivity" (α = .71 [husbands] and .67 [wives]) appears to tap disinhibition, lack of forethought, or lack of planning (e.g., "I often act without thinking through all of the alternatives"). Responses were reversed as needed and averaged to create the final score, with higher scores reflecting greater **disinhibition**. The subscale labeled "restraint" (α = .66 [husbands] and .67 [wives]) appears to tap lack of willpower, lack of perseverance, or inattention (e.g., "I wish I had more self-discipline"). Responses were reversed as needed and averaged to create the final score, with higher scores reflecting greater **inattention**.

Dysexecutive Functioning Questionnaire (DEX)—The 20-item DEX (Wilson, Alderman, Burgess, Emslie, & Evans, 1996) assesses dysexecutive syndrome, or problems with executive functioning (α = .87 [husbands] and .89 [wives]). Participants responded on a frequency scale from 0 (never) to 4 (very often). Although some attempts have been made to identify subscales of the DEX (e.g., Bodenburg & Dopslaff, 2008; Chaytor & Schmitter-Edgecombe, 2007; Mooney, Walmsley, & McFarland, 2006), results have not been consistent across studies. Accordingly, based on item content, we created three 4-item subscales tapping **disinhibition** (items 2, 4, 15, 16; e.g., "I act without thinking, doing the first thing that comes to mind"; α = .74 [husbands] and .73 [wives]), **inattention** (items 10, 17, 18, 19; e.g., "I find it difficult to keep my mind on something and am easily distracted"; α = .72 [husbands] and .76 [wives]), and **cognitive inflexibility** (items 3, 6, 7, 14; "I find it hard to stop repeating saying or doing things once I've started"; α = .65 [husbands] and .67 [wives]).[4] Responses were reversed as needed and averaged to create each subscale.

Analysis Strategy

First, we examined descriptive information and bivariate correlations between variables to better understanding how the measures of disinhibition, inattention, and executive dysfunction relate to each other. Next, we followed the recommendations of Shanock and colleagues (2010), adapted to suit our dyadic data, to conduct polynomial regressions with response surface analysis. First we ran these analyses for models testing disinhibition. Then

[4]Two other subscales, emotional impairment and social impairment, are not relevant to the current analyses.

we ran these analyses for models of inattention and executive dysfunction, to demonstrate discriminant validity.

1. We examined the correlations between husbands' and wives' scores to confirm that there was likely to be variability in the extent to which partners were similar or discrepant on the disinhibition variables.

2. We conducted mixed effect polynomial regression analyses using maximum likelihood estimation with robust standard errors in Stata 14 (StataCorp, 2015). We conducted analyses using indistinguishable dyads[5] and a person pairwise dataset (Kashy & Donnellan, 2012; Kenny et al., 2006). We included the main effect of actor disinhibition (*X*), the main effect of partner disinhibition (*Y*), the squared term for the effect of actor disinhibition (X^2), the multiplicative Actor X Partner interaction (*XY*), and the squared term for the effect of partner disinhibition (Y^2). In all analyses, we included the main effects of gender (-0.5 = male, 0.5 = female), actor age in years, race (0 = white, 1 = non-white), relationship length in years, actor education (1 = less than 8th grade to 9 = postgraduate), household income (1 = less than 10,000 to 7 = 75,000 or greater), and both actor and partner past-year alcohol use. All covariates were grand mean centered prior to entry. Accordingly, the intercept represents the value on the outcome variable for participants of average age, average relationship length, average education, average household income, and average alcohol use, averaged across male/female status and white/non-white status (the regression coefficients for the demographic covariates are available in Supplementary Table 1). Given our disproportionate sampling method, we use sampling weights in all analyses to allow us to generalize to the full population.

3. When models containing polynomial analyses are significant, the coefficients from the analysis are used to determine the response surface effects (Edwards, 2002; Nestler et al., 2015; Shanock et al., 2010). In other words, the individual coefficients from the analysis are not typically interpreted (but we include these coefficients in the Supplementary materials for those who are interested). Instead, the focus of analysis is typically on the surface values. Accordingly, we calculated the surface values using formulas provided by Shanock and colleagues (2010), and determined the significance levels using the *lincom* function in Stata.

   The line of congruence (*a1*) depicts $X = Y$ and represents how agreement between two variables relate to an outcome variable (e.g., does greater similarity in disinhibition predict lower satisfaction, as predicted by the Volatility Hypothesis?).

[5]We formally tested for distinguishability prior to conducting our primary analyses. Dyads can be distinguishable in terms of: 1) means, 2) variances, and 3) intrapersonal and interpersonal correlations (i.e., actor and partner paths; Kenny et al., 2006). Dyad members were completely indistinguishable by gender in nearly two-thirds of tests (27/45). They were only distinguishable by means in another 9 tests, and therefore, could be treated as indistinguishable because we controlled for gender in the analyses (Kenny et al., 2006). In the remaining 6 tests (No-Go errors and satisfaction; GoStop Ratio and satisfaction; BSCS and negative partner behavior; Stroop and satisfaction; TMT-A and partner responsiveness; working memory and negative partner behavior), dyad members were distinguishable by means and variances, but not by actor, partner, or interaction effects. Given the small number of tests where this was the case (6/45 or 14% of tests, with no clear pattern), and given that none of the paths were distinguishable by gender, we continue to treat dyad members as indistinguishable across all tests. Additional information is available from the first author upon request.

The test for curvature of this line (*a2*) represents the extent to which this association is nonlinear (e.g., does greater similarity [low or high] in disinhibition predict greater satisfaction, as predicted by the Compatibility Hypothesis?). The line of incongruence (*a3*) depicts $X = -Y$ and represents the extent to which the direction of discrepancy matters (e.g., does it matter whether the actor or the partner is higher in disinhibition?). The test for curvature of this line (*a4*) represents the extent to which this association is nonlinear (e.g., does greater discrepancy in disinhibition [whether the actor is lower or higher] predict lower satisfaction, as would be predicted by the Incompatibility Hypothesis?.

4. We graphed the surface values. We present only prototypical figures here, but the remaining figures are included in the Supplementary material.

5. When the models were significant, we tested whether negative partner behavior and perceived partner responsiveness mediated the association between disinhibition and relationship satisfaction. We included coefficients for negative partner behavior and perceived partner responsiveness in the satisfaction model, and examined whether the originally significant surface effect(s) fell to non-significance.

Results

Descriptive Information

Descriptive statistics and bivariate correlations for the final variables are presented in Table 1. Outliers on all variables were Winsorized separately for husbands and wives. Linear transformations were used as necessary to reverse variables and put them onto a scale from -2 to +2 (as recommended for Response Surface Analysis; Edwards, 2002; Nestler et al., 2015; Shanock et al., 2010), with higher scores indicating greater impairment.

Is disinhibition unitary?—As is common in the impulsivity literature (Cyders & Coskunpinar, 2011; Duckworth & Kern, 2011), the behavioral and self-report assessments of disinhibition were independent (all *r*s < .08; see Table 1). Among the behavioral assessments, the correlations varied from not significant (TMT-Diff with GoStop Ratio) to strong (Go-Stop Ratio with No-Go Errors). The self-report assessments of disinhibition, the BSCS and DEX, were strongly correlated with each other. Thus, based on bivariate correlations, the separate assessments of disinhibition would not appear to reflect a single construct.

Is disinhibition distinguishable?—As shown in Table 1, the TMT-Diff correlated modestly with several other behavioral measures, indicating that this task is not a pure assessment of disinhibition.[6] The GoStop Ratio was not significantly correlated with any other task (all *r*s < .09). No-Go Errors were only weakly correlated with any other

[6]The correlations between the TMT-Diff and the Stroop and the TMT-A (see Table 1) were much weaker than those for the TMT-B and the Stroop, $r = .28$, $p < .001$, and the TMT-B and the TMT-A, $r = .48$, $p < .001$. Thus, subtracting the TMT-A from the TMT-B did appear to lessen at least some of the variance attributable to inattention (the correlations between the TMT-B and the executive dysfunction tasks, not shown, were comparable to those for the TMT-Diff presented in Table 1).

behavioral tasks (all *r*s < .14). Consistent with prior research (e.g., Duckworth & Kern, 2011), the self-report assessments of disinhibition correlated strongly with the self-report assessments of other impulsivity factors. Accordingly, based on bivariate correlations, disinhibition would not appear to be completely independent of our assessments of inattention and executive dysfunction.

Is there variability in partner similarity?—Husbands' and wives' scores on disinhibition were only weakly correlated (all *r*s < .14, see the diagonal in Table 1), suggesting enough variability exists within couples to examine the effects of similarity and dissimilarity on disinhibition. Similarly, husbands' and wives' scores on inattention and the digit span were not significantly correlated (all *r*s < .09). Unexpectedly, husbands' and wives' scores on cognitive inflexibility were weakly to modestly correlated (*r*s = .08-.26). Overall, however, our first criterion for conducting RSA was met, and we moved on to the mixed effect polynomial regression analyses.

RSA Analyses: Disinhibition

The disinhibition models that included the polynomial regression terms all showed a significant improvement in fit over models that included only the control variables, satisfying the second criterion for conducting RSA. The model fit statistics are included in Table 2. The RSA results for all disinhibition analyses are included in Table 2 as well.[7]

TMT-Diff—Analyses revealed significant curvilinear associations between the line of congruence for the TMT-Diff and all three relationship outcomes (see Table 2, *a2* coefficients, and Figure 1, panels a-c). Consistent with the Compatibility Hypothesis, the surface is concave for negative partner behavior and convex for both perceived partner responsiveness and relationship satisfaction. Subsequent mediation analyses showed that the curvilinear association between the line of congruence and relationship satisfaction became non-significant when negative partner behavior and perceived partner responsiveness were included in the model, $b = .051$, *95% CI* = [-.034, .137], $p = .240$. In other words, greater similarity between actor and partner disinhibition (both low or both high) is associated with reports of less frequent negative partner behavior and greater partner responsiveness, which lead to greater relationship satisfaction.[8]

GoStop Ratio—Analyses revealed significant linear associations between the line of congruence and all three outcomes (see Table 2, *a1* coefficients). These linear associations were qualified by marginally significant curvilinear associations (see Table 2, *a2* coefficients). The response surfaces were very similar to (but somewhat flatter than) those for disinhibition assessed on the TMT-Diff (see Supplementary Figure 1, panels a-c). Subsequent mediation analyses showed that the curvilinear association between the line of congruence and relationship satisfaction became non-significant when negative partner

[7]The focus of RSA is on the overall fit of the model and comparisons to the lines of congruence and incongruence, not on the individual regression coefficients. However, the regression coefficients for all disinhibition analyses are displayed in Supplementary Table 2 for those who are interested.

[8]The pattern of interactions, and even the significance levels, were extremely similar when the TMT-B was used in place of the TMT-Diff.

behavior and perceived partner responsiveness were included in the model, b = .017, *95% CI* = [-.056, .090], p = .646. These results are more consistent with the Compatibility Hypothesis than the Volatility Hypothesis: greater similarity between actor and partner disinhibition is associated with reports of less frequent negative partner behavior and greater partner responsiveness, leading to greater relationship satisfaction. However, these associations were stronger for those who matched on low disinhibition than for those who matched on high disinhibition.

No-Go Errors—Unexpectedly, none of the surface tests relating No-Go Errors to negative partner behavior reached significance. However, the curvilinear associations between the line of congruence and both perceived partner responsiveness and relationship satisfaction were significant and positive (see Table 2, *a2* coefficients). The response surfaces were very similar to (but somewhat flatter than) those for disinhibition assessed on the TMT-Diff (see Supplementary Figure 2, panels a-c). Subsequent mediation analyses revealed that the curvilinear association between the line of congruence and relationship satisfaction became non-significant when perceived partner responsiveness was included in the model, b = -.029, *95% CI* = [-.078, .020], p = .246. Consistent with the Compatibility Hypothesis, greater similarity between actor and partner disinhibition (both low or both high) is associated with greater perceived partner responsiveness, which leads to greater relationship satisfaction.

BSCS-Disinhibition—Unexpectedly, none of the surface tests relating the disinhibition subscale of the BSCS to negative partner behavior reached significance. However, the linear associations between the line of incongruence and both perceived partner responsiveness and relationship satisfaction were significant and negative (see Table 2, *a3* coefficients). These associations were qualified by significant, negative curvilinear associations between the line of incongruence and both outcomes (see Table 2, *a4* coefficients). The response surfaces follow a somewhat different pattern than those for the behavioral disinhibition indices. These surfaces are plotted in Figure 2, panels a-c. The surface is concave for both perceived partner responsiveness and relationship satisfaction. The curvilinear association between the line of incongruence and relationship satisfaction was reduced to marginal significance when perceived partner responsiveness was included in the model, b = -.117, *95% CI* = [-.242, .009], p = .068, suggesting at least partial mediation. Consistent with the Incompatibility Hypothesis, the more dissimilar the actor and partner are in terms of disinhibition, the lower their perceived partner responsiveness and subsequent relationship satisfaction.

DEX-Disinhibition—Unexpectedly, none of the surface tests relating the disinhibition subscale of the DEX to negative partner behavior reached significance. The squared coefficient for the line of congruence predicted only perceived partner responsiveness (see Table 2, *a2* coefficients). However, the squared coefficient for the line of incongruence predicted both perceived partner responsiveness and satisfaction (see Table 2, *a4* coefficients). The response surfaces were very similar to those for disinhibition assessed on the BSCS (see Supplementary Figure 3, panels a-c). Subsequent mediation analyses showed that the curvilinear association between the line of incongruence and relationship satisfaction fell to non-significance when perceived partner responsiveness was included in

the model, b = .045, *95% CI* = [-.053, .144], p = .368. Consistent with the Incompatibility Hypothesis, the more dissimilar the actor and partner are in terms of disinhibition, the lower their perceived partner responsiveness and subsequent relationship satisfaction.

Meta-analytic summary—The curvilinear association between the line of *congruence* and relationship functioning (*a2*) was significant or marginally significant in eight out of nine tests involving behavioral assessments of disinhibition. The curvilinear association between the line of *incongruence* and relationship functioning (*a4*) was significant for four out of six tests involving self-report assessments of disinhibition. Because the behavioral and self-report assessments of disinhibition did not lead to the same conclusions, and because the results for negative partner behavior were inconsistent, we conducted a meta-analysis using the Stouffer Combined Test (Stouffer, Suchman, De Vinney, Star, & Willims Jr., 1949) to examine the consistency of the four surface coefficients (i.e., *a1 – a4*) across tests. The effect sizes were all drawn from the same sample, so we used a correction factor that assumed modest non-independence (r = .30). The meta-analysis revealed strong evidence for the consistency of our effects.

There was little evidence in favor of the **Volatility Hypothesis** (i.e., significant *a1* coefficients). The linear associations between the line of congruence and negative partner behavior (d = 0.07, z = 1.19, p = .235), perceived partner responsiveness (d = -0.02, z = -0.36, p = .720), and relationship satisfaction (d = -0.05, z = -0.83, p = .407) all failed to reach significance. Conversely, results of the meta-analysis supported the **Compatibility Hypothesis** (significant *a2* coefficients). The curvilinear associations between the line of congruence and negative partner behavior (d = -0.12, z = -2.07, p = .039), perceived partner responsiveness (d = 0.17, z = 2.93, p = .003), and relationship satisfaction (d = 0.11, z = 2.00, p = .045) were all significant. In other words, greater similarity between actor and partner disinhibition is associated with reports of less frequent negative partner behavior and greater partner responsiveness, leading to greater relationship satisfaction. We also found some support in favor of the **Incompatibility Hypothesis** (significant *a4* coefficients). The curvilinear association between the line of congruence and negative partner behavior failed to reach significance (d = .08, z = 1.47, p = .142), but this association was significant for both perceived partner responsiveness (d = -0.14, z = -2.56, p = .010) and relationship satisfaction (d = -0.13, z = -2.23, p = .025). In other words, greater dissimilarity between actor and partner disinhibition is associated with lower perceived partner responsiveness and lower subsequent relationship satisfaction.[9]

Discriminant Validity

Inattention—Inattention was assessed with the Stroop (reversed), TMT-A, the inattention subscale of the BSCS, and the inattention subscale of the DEX. All models that included the polynomial regression terms showed a significant improvement in model fit over models

[9]We had no a priori hypotheses regarding the direction of the discrepancy in partners' disinhibition scores (significant *a3* coefficients), and indeed the linear associations between the line of incongruence and negative partner behavior (d = 0.05, z = 0.92, p = .358), perceived partner responsiveness (d = -0.04, z = -0.76, p = .446), and relationship satisfaction (d = -0.09, z = -1.59, p = .112) were not significant. Similarly, none of the meta-analytic *a3* coefficients were significant for inattention (all ps > .081) or executive dysfunction (all ps > .079).

that included just the control variables, all $\Delta\chi^2(5) > 11.30$, all *p*s < .047. The RSA results for all inattention analyses are included in Table 3.[10]

As in the disinhibition analyses, we conducted a meta-analysis to test the consistency of our obtained results. We did not find any evidence consistent with the Volatility Hypothesis in the meta-analysis (none of the *a1* coefficients were significant, all *p*s > .225). Nor did we find evidence consistent with the Compatibility Hypothesis (none of the *a2* coefficients were significant, all *p*s > .773). Unexpectedly, even though no individual tests were significant, we did find some support for the Incompatibility Hypothesis in the meta-analysis. The curvilinear association between the line of incongruence and reports of negative partner behavior was significant, $d = 0.12$, $z = 1.99$, $p = .046$. Greater dissimilarity between actor and partner inattention was associated with reports of more frequent negative partner behavior. The *a4* coefficients were not significant for perceived partner responsiveness ($d = -0.07$, $z = -1.24$, $p = .215$) or relationship satisfaction ($d = -0.06$, $z = -1.04$, $p = .298$).

Executive Dysfunction—Cognitive inflexibility was assessed with the WCST-perseverative errors, the WCST-non-perseverative errors, and the cognitive inflexibility subscale of the DEX. All models that included the polynomial regression terms showed a significant improvement in model fit over models that included just the control variables, all $\Delta\chi^2(5) > 12.23$, all *p*s < .033. The RSA results for all executive dysfunction analyses are included in Table 4.[11]

We again conducted a meta-analysis to test the consistency of our obtained results. There was some weak evidence in favor of the Volatility Hypothesis. Although we did not find a significant association between the line of congruence and negative partner behaviors ($d = 0.01$, $z = 0.14$, $p = .890$) or perceived partner responsiveness ($d = -0.05$, $z = -0.93$, $p = .353$), the association with relationship satisfaction was marginally significant, $d = -0.11$, $z = -1.92$, $p = .055$. Inspection of the effects indicates that this effect was almost completely driven by the very large effect on the DEX cognitive inflexibility measure ($d = -0.39$), and thus, should be interpreted with caution. We did not find any evidence consistent with the Compatibility Hypothesis (all *p*s > .350). We did find weak support for the Incompatibility Hypothesis. Although the curvilinear association between the line of incongruence and reports of negative partner behavior ($d = 0.09$, $z = 1.49$, $p = .135$) and relationship satisfaction ($d = -0.06$, $z = -1.07$, $p = .286$) were not significant, the association with perceived partner responsiveness was marginally significant, $d = -0.11$, $z = -1.82$, $p = .068$. This effect was driven almost entirely by the WCST perseverative errors ($d = -0.28$),[12] and thus, should be interpreted with caution.

Discussion

There is reason to expect that couples in which at least one partner is highly impulsive will experience lower quality relationships. Highly impulsive people are more likely to enact

[10]The regression coefficients for all inattention analyses are displayed in Supplementary Table 3.
[11]The regression coefficients for all executive dysfunction analyses are displayed in Supplementary Table 4.
[12]The response surfaces for WCST perseverative errors were very similar to those for disinhibition assessed on the BSCS (see Supplementary Figure 4, panels a-c).

negative behaviors, like saying socially inappropriate things (von Hippel & Gonsalkorale, 2005), flirting with alternatives to their romantic partner (Pronk et al., 2011), and engaging in more frequent, less constructive, or more violent partner conflict (Finkel & Campbell, 2001; Finkel et al., 2009; Tangney et al., 2004). Additionally, more impulsive people may be more likely to act in their own best interest, leaving their partner with less evidence that it is safe to trust in their likely responsiveness (Gomillion et al., 2014; Righetti & Finkenauer, 2011). Accordingly, it seems reasonable to assume that couples with at least one highly impulsive partner would report lower relationship satisfaction. And indeed, previous research has supported this assumption (Kelly & Conley, 1987; Robins et al., 2000; Stroud et al., 2010).

What about couples in which both partners are highly impulsive? We tested three competing hypotheses regarding the effects of being concordant on impulsivity. According to the Volatility Hypothesis, the negative effects seen in couples with only one impulsive partner should be exacerbated, decreasing relationship quality. Conversely, the Compatibility Hypothesis suggests that the more similar partners are in terms of impulsivity, the better their relationship quality. Similarly, the Incompatibility Hypothesis suggests that the more dissimilar partners are in terms of impulsivity, the worse their relationship quality. In the current study, we found strong evidence in favor of the Compatibility and Incompatibility Hypotheses when considering disinhibition. In other words, whether partners "matched" on low or high disinhibition, they were better off than if they were "mismatched."

The Importance of Considering Multiple Factors of Impulsivity

Impulsivity is a multifactor construct, and there is disagreement regarding how many factors exist, how best to measure them, and whether behavioral and self-report assessments tap the same underlying constructs. In the current analyses, we focused on assessments of disinhibition, inattention, cognitive inflexibility, and working memory. Results of the individual tests for disinhibition indicate that we were more likely to find evidence consistent with the Compatibility Hypothesis when using the behavioral tests, whereas we were more likely to find evidence consistent with the Incompatibility Hypothesis when using the self-report questionnaires. Although the take-away message is essentially the same —matching on disinhibition is better than mismatching—these more nuanced results suggests that there are qualitative differences between the behavioral and self-report assessments of disinhibition, consistent with prior work in this area (e.g., Buchanan, in press; Cyders & Coskunpinar, 2011; Duckworth & Kern, 2011; Reynolds et al., 2006).

Moreover, we generally failed to find these effects when considering other factors of impulsivity. The results for individual tests of inattention were mostly non-significant. There was some evidence in favor of the Volatility Hypothesis solely for the BSCS-Inattention (see Table 3, *a1* coefficients). Vohs and colleagues (2011) used the full Brief Self-Control Scale in their work. Thus, it may be that this inattention subscale outweighed the disinhibition subscale in their work. The fact that results were significant only on this one subscale of inattention in the current work does lead us to question our conceptual groupings. Perhaps self-reported perseverance is, in fact, a separate category from inattention. Neither the BSCS nor the DEX were included in the meta-analytic factor

analysis (Sharma et al., 2013), however, and thus the extent to which these subscales capture the same factor of impulsivity as other measures of perseverance is still an open question.

Furthermore, the results for executive dysfunction in the current study suggest that our assessments are not part of a unitary group. The DEX-Cognitive Inflexibility assessment showed evidence in favor of the Volatility Hypothesis (see Table 4, *a1* coefficients). Conversely, the WCST-perseverative errors showed evidence in favor of the Incompatibility Hypothesis (see Table 4, *a4* coefficients). The Wisconsin Card Sort, in particular, is not a unitary assessment. In addition to "switching," or cognitive inflexibility, perseverative errors also reflect an inability to inhibit a prepotent response (i.e., disinhibition) and an inability to focus (i.e., inattention). Thus, it may be the case that the results for the WCST-perseverative errors in the current study were driven primarily by the inhibition aspect, rather than the switching aspect. This intriguing finding requires more attention in future research.

It is worth noting that the compatibility and incompability results we obtained are inconsistent with previous research using different measures and analytic techniques. We have already mentioned the Vohs et al. (2011) work. Additionally, Dyrenforth and colleagues (2010) failed to obtain a significant Actor Conscientiousness X Partner Conscientiousness interaction predicting marital satisfaction. Yet, the overall conscientiousness superfactor taps both disinhibition and, to a greater extent, inattention. Similarly, Robins and colleagues (2000) failed to obtain a significant Actor MPQ-Constraint X Partner MPQ-Constraint interaction predicting relationship satisfaction and relationship quality. However, in addition to the subscale of control (i.e., disinhibition), the MPQ-Constraint includes the subscales of harm avoidance (i.e., sensation seeking) and traditionalism. To our knowledge, no previous research has examined the effect of matching specifically on disinhibition. Additionally, no research has used polynomial regression with response surface analysis to examine these questions. As the literature on impulsivity continues to grow, it will be important to distinguish between different factors of impulsivity and to consider different forms of analysis when considering the effects of impulsivity on interpersonal interaction.

Impulsivity is often pathologized, but it is not bad in all contexts. For example, more disinhibited people might respond more quickly to emergency situations, like helping people out of a burning building. The situational context determines the extent to which disinhibition is more or less appropriate. Indeed, research has demonstrated that the situational context is crucial in determining whether impulsivity has positive or negative outcomes. In situations that favor delayed rewards to immediate rewards, greater disinhibition predicts poorer outcomes. In contrast, in situations that favor immediate rewards to delayed rewards, greater disinhibition predicts better outcomes (Otto, Markman, & Love, 2012).

It is easy to predict how certain relationship contexts might influence the optimality of impulsive choice. In relationships where one partner engages in impulsive decision making and the other does not, the situational context would likely punish choices that lead to immediate rewards (e.g., the less disinhibited partner might disapprove of a large purchase made by the more disinhibited partner, and thus neither partner enjoys the item). However,

in relationships where both partners engage in impulsive decision making, the situational context likely would not punish and might even reward choices that lead to immediate rewards (neither partner might worry about the long-term consequences of a large purchase, and thus both enjoy the item). Conversely, it is more difficult to imagine contexts (both relational and more generally) in which inattention, cognitive inflexibility, or poor working memory might be beneficial.

Limitations and Strengths

Data for the current analyses were taken from the first wave of an ongoing longitudinal study, and thus, are cross-sectional in nature. Moreover, our proposed mediators were strongly correlated with our proposed outcome. Accordingly, we cannot be completely certain of our proposed causal ordering. Nevertheless, impulsivity is generally considered to be a relatively stable individual difference characteristic (e.g., Barratt & Patton, 1983; Links, Heslegrave, & Reekum, 1999; Moeller, Barratt, Dougherty, Schmitz, & Swann, 2014; White et al., 1994). Additionally, our previous research has shown that changes in perceived partner responsiveness precede changes in relationship satisfaction over time (Derrick et al., 2012), providing partial support for the proposed order of mediation.

The absolute effect sizes we obtained in the current study were relatively modest. Our meta-analytic summary demonstrated that the average effect sizes for the overall *a2* and *a4* surface effects ranged from $d = .08$ to $d = .17$. These relatively small effect sizes suggest that sample sizes need to be relatively large, with sufficient numbers scoring high on disinhibition, for compatibility and incompatibility effects to emerge. Indeed, the current analyses were drawn from a community sample in which many participants were heavy alcohol users. Such a sample is more likely to be "at risk" for high disinhibition than, for example, a college student sample. If the high disinhibition tail were more sparse or missing altogether, as might happen in a convenience sample, we might have failed to obtain (dis)similarity effects and would most likely have observed only main effects for the detrimental consequences of impulsivity.

Finally, the study from which the data were drawn was not designed to examine separate facets of impulsivity. As such, some of our measurement choices were not ideal. We lacked assessments of delay discounting, urgency, and sensation seeking, and we decided on a conceptual basis which impulsivity factor each of our existing assessments tapped. Still, our decisions were mostly validated by the uniformity of our results (with the exception of the BSCS-Inattention and the WCST-perseverative errors). Future studies that are specifically designed to examine separate impulsivity factors in a relationship context will be invaluable.

Despite these limitations, the results of the current study are impressive for at least three reasons. First, we used both self-report and behavioral assessments to approximate the assessment of several factors of impulsivity, allowing us to provide both convergent and discriminant confirmation of our results. Second, we used a relatively large (n = 280 couples) community sample of married and long-term cohabiting couples. Thus, our results do not suffer from the typical limitations of small convenience samples. Finally, we found these effects among partners who had been living together for an average of ten years. Thus,

our analyses are conservative because truly discrepant partners likely would have exited the relationship.

Conclusion

We began this paper with a description of a couple in which both partners, Claire and Phil, were highly impulsive. Although lay wisdom suggests that they are doomed to experience an unsuccessful marriage, our results suggest a happy, if somewhat surprising alternative. Because Claire and Phil are both disinhibited, they are compatible. Therefore, they are less likely to encounter negative partner behaviors, and they are more likely to feel understood, approved of, and cared for. Accordingly, Claire and Phil will experience greater relationship satisfaction than they would if only one of them were impulsive.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Highlights

- (Dis)similarity on impulsivity is used to predict relationship functioning
- Mixed effect polynomial regression and response surface analysis are used
- “Matching” on disinhibition leads to greater satisfaction than “mismatching”
- Negative partner behavior and perceived partner responsiveness mediate
- Results differ for inattention, cognitive inflexibility, and working memory

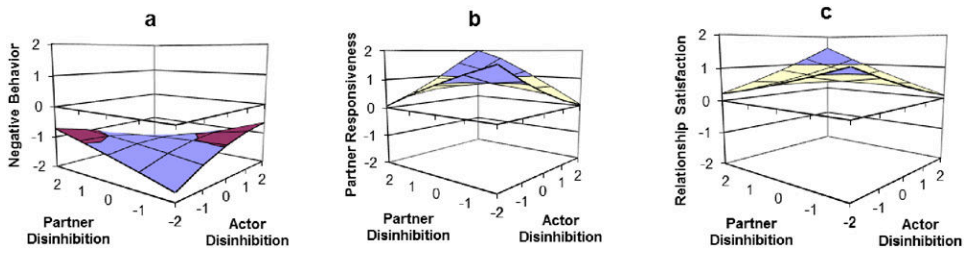

Figure 1.

Response surfaces for actor and partner disinhibition on the TMT-Diff predicting a) negative partner behavior, b) perceived partner responsiveness, and c) relationship satisfaction. Color figures are available online.

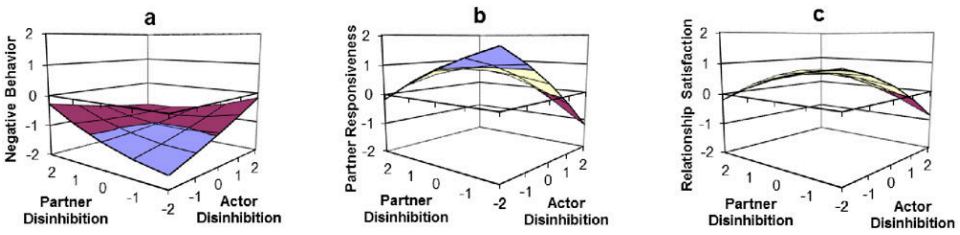

Figure 2.

Response surfaces for actor and partner disinhibition on the Brief Self-Control Scale predicting a) negative partner behavior, b) perceived partner responsiveness, and c) relationship satisfaction. Color figures are available online.

Table 1

Descriptive statistics and bivariate correlations for the final transformed variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Disinhibition																
1. TMT-Diff	.06															
2. GoStop Ratio	-.02	.08														
3. No-Go Errors	.13*	.49***	.13*													
4. BSCS – Disinhibition	-.01	.04	.01	.04												
5. DEX – Disinhibition	.00	.05	.07	.51***	.05											
Inattention																
6. TMT-A	.15**	-.03	.05	-.04	-.01	-.08										
7. Stroop	.19***	.03	.13*	.02	-.07	.31***	.07									
8. BSCS – Inattention	-.01	.01	.08	.44***	.37***	.06	-.01	-.01								
9. DEX – Inattention	-.07	-.02	.03	.44***	.69***	.08	-.03	.33***	.01							
Executive Dysfunction																
10. WCST – PERSV	.17**	.06	.12+	-.03	.07	.11+	.01	.04	-.07	.17**						
11. WCST – NPERSV	.20**	.05	.12+	-.04	.10*	.09	.05	.05	-.01	.81***	.08+					
12. DEX – COG INFL	-.02	.01	.10+	.38***	.57***	.02	- .06	.26***	.57***	-.03	- .03	.26**				
13. Digit Span – Total	.28***	.05	.10+	-.02	.09	.06	.16**	-.08	.04	.14*	.08	.12*	.07			
Relationship Outcomes																
14. NEG BEH	.02	.15*	.12	.21***	.17**	-.03	-.05	.07	.19**	.01	-.02	.14**	-.05	.52***		
15. PPR	-.07	-.07	-.05	-.20**	-.24***	-.16**	-.03	-.08	-.22**	-.10	-.13*	-.15*	.05	-.59***	.53***	
16. REL SAT	-.07	-.11+	-.09+	-.22**	-.22***	-.09	-.03	-.09	-.21***	-.08	-.06	-.21***	.03	-.61***	.76***	.65***
Descriptive Statistics																
Mean	-0.57	0.07	-1.24	-0.68	-0.90	-0.20	0.07	0.09	-0.91	-1.07	-1.01	-1.43	0.06	-1.12	0.91	0.68
Standard Deviation	0.90	0.77	1.07	0.80	0.70	0.91	1.02	0.81	0.81	1.03	0.95	0.66	0.80	0.64	0.93	0.59

Note. Correlations on the diagonal are between men and women within the same couple. Linear transformations were used on all variables as necessary to reverse them and to put them onto a scale from -2 to +2. Higher scores on all impulsivity measures indicate poorer functioning. Values were calculated using sampling weights. TMT-Diff = Trail Making Test Part B minus Trail Making Test Part A; BSCS

= Brief Self-Control Scale; DEX = Dysexecutive Functioning Questionnaire; TMT-A = Trail Making Test Part A; WCST = Wisconsin Card Sorting Test; PERSV = perseverative errors; NPERSV = nonperseverative errors; COG INFL = cognitive inflexibility; REL SAT = relationship satisfaction; NEG BEH = negative partner behavior; PPR = perceived partner responsiveness.

$^{+}p < .10$,

$^{*}p < .05$,

$^{**}p < .01$,

$^{***}p < .001$

Table 2

Response surface follow-up tests for the mixed effect polynomial regression analyses involving disinhibition.

	Negative Partner Behavior		Perceived Partner Responsiveness		Relationship Satisfaction	
	b	**95% CI**	***b***	**95% CI**	***b***	**95% CI**
TMT-Diff[a]						
a1	-.124^{+}	[-.264, .016]	.127	[-.115, .370]	.090	[-.093, .272]
a2	-.225***	[-.358, -.093]	.254*	[.037, .471]	.187*	[.027, .347]
a3	.023	[-.055, .100]	-.007	[-.127, .113]	-.030	[-.108, .047]
a4	.098	[-.099, .296]	-.206	[-.519, .107]	-.121	[-.340, .098]
Δ *in model fit*	$\Delta\chi^2(5) = 41.93$, p < .001	$\Delta\chi^2(5) = 38.21$, $p < .001$	$\Delta\chi^2(5) = 34.72$, $p < .001$			
GoStop Ratio						
a1	.243**	[.091, .395]	-.336**	[-.548, - .123]	-.172*	[-.308, - .036]
a2	-.127^{+}	[-.285, .031]	.219^{+}	[-.018, .455]	.120^{+}	[-.015, .256]
a3	.031	[-.052, .114]	.077	[-.079, .232]	.024	[-.064, .112]
a4	.075	[-.160, .309]	-.240	[-.643, .163]	-.193	[-.467, .082]
Δ *in model fit*	$\Delta\chi^2(5) = 26.40$, $p < .001$	$\Delta\chi^2(5) = 35.81$, $p < .001$	$\Delta\chi^2(5) = 23.29$, $p < .001$			
No-Go Errors						
a1	.024	[-.197, .245]	.217	[-.050, .484]	.060	[-.113, .233]
a2	-.017	[-.130, .096]	.176*	[.015, .337]	.050**	[.041, .086]
a3	.039	[-.058, .136]	.112*	[.009, .216]	-.025	[-.082, .032]
a4	.074	[-.031, .180]	-.107	[-.248, .035]	-.062	[-.170, .045]
Δ *in model fit*	$\Delta\chi^2(5) = 20.73$, $p < .001$	$\Delta\chi^2(5) = 34.52$, $p < .001$	$\Delta\chi^2(5) = 17.36$, $p = .004$			
BSCS - Disinhibition						
a1	.172	[-.028, .372]	-.137	[-.411, .137]	-.145	[-.332, .041]
a2	-.062	[-.209, .086]	.158	[-.046, .363]	.036	[-.119, .191]
a3	.028	[-.098, .154]	-.251**	[-.427, - .074]	-.159***	[-.241, - .076]
a4	.199	[-.066, .464]	-.371*	[-.735, - .008]	-.290*	[-.519, - .061]
Δ *in model fit*	$\Delta\chi^2(5) = 28.81$, $p < .001$	$\Delta\chi^2(5) = 47.84$, $p < .001$	$\Delta\chi^2(5) = 50.18$, $p < .001$			

	Negative Partner Behavior		Perceived Partner Responsiveness		Relationship Satisfaction	
	b	**95% CI**	***b***	**95% CI**	***b***	**95% CI**
DEX - Disinhibition						
a1	.089	[-.185, .363]	.059	[-.375, .493]	-.068	[-.406, .270]
a2	-.071	[-.240, .097]	.256*	[.001, .512]	.127	[-.147, .400]
a3	.037	[-.101, .176]	-.258**	[-.442, - .073]	-.018	[-.104, .068]
a4	.167	[-.086, .420]	-.428**	[-.754, - .102]	-.145*	[-.274, - .017]
Δ *in model fit*	$\Delta\chi^2(5) = 17.77$, $p = .003$	$\Delta\chi^2(5) = 71.32$, $p < .001$	$\Delta\chi^2(5) = 43.69$, $p < .001$			

Note. Surface tests were conducted using the recommendations of Shanock and colleagues (2010). *a1* refers to the slope of the line of congruence, or the extent to which greater disinhibition in both partners is associated with relationship functioning. *a2* refers to the curvature of the slope of the line of congruence, or the extent to which matching on disinhibition (both low or both high) is associated with relationship functioning. *a3* refers to the line of incongruence, or the extent to which the direction of the discrepancy (i.e., is the actor or partner higher on disinhibition?) is associated with relationship functioning. *a4* refers to the curvature of the line of incongruence, or the extent to which overall discrepancy in disinhibition is associated with relationship functioning. A significant *a1* with a non-significant *a2* would support the Volatility Hypothesis. A significant *a2* would support the Compatibility Hypothesis. A significant *a4* would support the Incompatibility Hypothesis. *b* = unstandardized regression coefficient; *95% CI* = 95% confidence interval; TMT-Diff = Trail Making Test Part B minus Trail Making Test Part A; BSCS = Brief Self-Control Scale; DEX = Dysexecutive Functioning Questionnaire.

[a] Results for the Trail Making Test Part B were similar to those for the TMT-Diff, with comparable significance levels.

+ $p < .10$,

* $p < .05$,

** $p < .01$,

*** $p < .001$

Table 3

Response surface follow-up tests for the mixed effect polynomial regression analyses involving inattention.

	Negative Partner Behavior		Perceived Partner Responsiveness		Relationship Satisfaction	
	b	**95% CI**	***b***	**95% CI**	***b***	**95% CI**
Stroop						
a1	-.062	[-.190, .066]	.016	[-.182, .214]	-.011	[-.132, .111]
a2	.086	[-.034, .206]	-.172	[-.385, .040]	-.121	[-.250, .008]
a3	-.006	[-.064, .052]	.047	[-.083, .177]	.029	[-.018, .076]
a4	.101	[-.032, .234]	-.125	[-.316, .065]	-.058	[-.200, .085]
TMT-A						
a1	-.032	[-.179, .115]	-.107	[-.324, .109]	-.070	[-.227, .087]
a2	-.023	[-.172, .126]	.033	[-.191, .257]	-.028	[-.162, .106]
a3	-.001	[-.066, .064]	-.112^{+}	[-.237, .013]	-.010	[-.073, .052]
a4	.107	[-.060, .275]	-.115	[-.411, .180]	-.108	[-.280, .064]
BSCS - Inattention						
a1	.150*	[.002, .297]	-.168^{+}	[-.366, .030]	-.117^{+}	[-.245, .012]
a2	.002	[-.174, .179]	.104	[-.132, .339]	.084	[-.076, .245]
a3	.014	[-.070, .098]	-.022	[-.150, .107]	-.044	[-.125, .037]
a4	.214	[-.050, .478]	-.025	[-.376, .327]	-.036	[-.305, .232]
DEX – Inattention						
a1	.116	[-.162, .393]	-.113	[-.420, .194]	-.006	[-.314, .183]
a2	-.032	[-.182, .118]	.141	[-.060, .341]	.100	[-.054, .255]
a3	.092^{+}	[-.005, .188]	-.284**	[-.446, - .122]	-.086	[-.202, - .030]
a4	.152	[-.104, .409]	-.173	[-.430, .083]	-.064	[-.281, .152]

Note. As per Shanock and colleagues (2010), *a1* refers to the extent to which greater inattention in both partners is associated with relationship functioning. *a2* refers to the extent to which matching on inattention (both low or both high) is associated with relationship functioning. *a3* refers to the extent to which the direction of the discrepancy (i.e., is the actor or partner higher on inattention?) is associated with relationship functioning. *a4* refers to the extent to which overall discrepancy in inattention is associated with relationship functioning. A significant *a1* with a non-significant *a2* would support the Volatility Hypothesis. A significant *a2* would support the Compatibility Hypothesis. A significant *a4* would support the Incompatibility Hypothesis. *b* = unstandardized regression coefficient; *95% CI* = 95% confidence interval; TMT-A = Trail Making Test PartA; BSCS = Brief Self-Control Scale; DEX = Dysexecutive Functioning Questionnaire.

$^{+}$ $p < .10$,

* $p < .05$,

** $p < .01$,

*** $p < .001$

Table 4

Response surface follow-up tests for the mixed effect polynomial regression analyses involving executive dysfunction.

	Negative Partner Behavior		Perceived Partner Responsiveness		Relationship Satisfaction	
	b	**95% CI**	***b***	**95% CI**	***b***	**95% CI**
WCST-Perseverative Errors						
a1	-.012	[-.183, .158]	.021	--.094, .136]	-.022	[-.120, .077]
a2	.035	[-.079, .150]	-.141*	[-.274, - .008]	-.049	[-.140, .042]
a3	-.019	[-.086, .047]	-.047	[-.177, .083]	.034	[-.036, .105]
a4	.155*	[.005, .305]	-.351***	[-.566, - .136]	-.154*	[-.288, - .020]
WCST-Non- Perseverative Errors						
a1	-.077	[-.250, .096]	.000	[-.221, .222]	-.027	[-.185, .131]
a2	-.080	[-.236, .075]	-.028	[-.235, .180]	.007	[-.127, .141]
a3	-.062	[-.135, .012]	-.092	[-.215, .031]	.049	[-.030, .128]
a4	.058	[-.060, .177]	-.132	[-.336, .072]	-.042	[-.153, .069]
DEX – Cognitive Inflexibility						
a1	.140	[-.049, .329]	-.333***	[-.517, - .149]	-.285***	[-.406, - .163]
a2	-.014	[-.145, .117]	-.038	[-.229, .152]	-.017	[-.130, .096]
a3	-.048	[-.200, .103]	-.305*	[-.584, - .026]	-.114	[-.294, .066]
a4	.021	[-.313, .355]	.053	[-.265, .372]	.114	[-.121, .349]
Digit Span						
a1	-.006	[-.175, .164]	.069	[-.144, .281]	.006	[-.152, .164]
a2	-.046	[-.253, .161]	.022	[-.272, .316]	-.057	[-.263, .149]
a3	-.104*	[-.207, -.001]	.029	[-.100, .158]	.045	[-.027, .117]
a4	.099	[-.095, .293]	-.105	[-.336, .126]	-.061	[-.193, .072]

Note. As per Shanock and colleagues (2010), *a1* refers to the extent to which greater dysexecutive function in both partners is associated with relationship functioning. *a2* refers to the extent to which matching on dysexecutive function (both low or both high) is associated with relationship functioning. *a3* refers to the extent to which the direction of the discrepancy (i.e., is the actor or partner higher on dysexecutive function?) is associated with relationship functioning. *a4* refers to the extent to which overall discrepancy in dysexecutive function is associated with relationship functioning. A significant *a1* with a non-significant *a2* would support the Volatility Hypothesis. A significant *a2* would support the Compatibility Hypothesis. A significant *a4* would support the Incompatibility Hypothesis. *b* = unstandardized regression coefficient; *95% CI* = 95% confidence interval; WCST = Wisconsin Card Sorting Test; DEX = Dysexecutive Functioning Questionnaire.

$^{+}p < .10$,

* $p < .05$,

** $p < .01$,

*** $p < .001$