Psychological Assessment

Symbolic Meanings of Sex in Relationships: Developing the Meanings of Sexual Behavior Inventory

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Consistent with symbolic interactionism and motivation research, the study explored the meanings of sexual behavior in romantic relationships in a sample of 3,003 online respondents. Starting with a pool of 104 respondent-generated items, Exploratory and Confirmatory Factor analyses in separate sample halves revealed a stable set of 9 dimensions within that item pool that formed 2 higher-order factors representing positive (to share pleasure, to bond, to de-stress, to energize the relationship, to learn more about each other) and negative (to manage conflict, as an incentive, to express anger, and to control partner) meanings of sexual behavior within relationships. Item Response Theory analyses helped select the 4–5 most effective items of each dimension for inclusion in the Meanings of Sexual Behavior Inventory (MoSBI). Generalizability analyses suggested that the MoSBI subscale scores continued to show high levels of internal consistency across a broad range of demographic subgroups (e.g., racial/ethnic groups, gay and lesbian respondents, and various levels of education). The MoSBI subscales demonstrated moderate and distinct patterns of association with a range of conceptual boundary scales (e.g., relationship and sexual satisfaction, emotional support, negative conflict behavior, and frequency of sexual behavior) suggesting that these scales represent novel relationship processes. Consistent with this, analyses in the 862 respondents completing a 2-month follow-up assessment suggested that the meanings of sexual behavior predicted residual change in relationship satisfaction, even after controlling for frequency of sexual behavior within the relationships. Implications are discussed.

Public Significance Statement
This study develops a self-report measure assessing positive and negative meanings of sexual behavior within romantic relationships (e.g., to bond with a partner, to relieve stress, and to control a partner). Predictive analyses over 2 months suggest that the meanings underlying sexual activity might be as important as the frequency of sexual activity for shaping the course of relationships over time.

Although different types of relationships share common characteristics such as companionship and camaraderie, in romantic relationships emotional bonding tends to be closely linked to the sexual aspects of those relationships (Sprecher, Christopher, & Cate, 2006). Kontula (2009) asserts that sex is typically a primary motivation in the initiation of romantic relationships and that the majority of sexual experiences occur between romantic partners. Hence, sexual behavior is a key element that separates romantic relationships from other types of relationships. Although a plethora of research exists about casual sexual intercourse and the associ-

ated consequences that often accompany related risky sexual behavior such as HIV and unwanted pregnancy (see van Kesteren, Hospers, van Empelen, van Breukelen, & Kok, 2007; Vasilenka, Lefkowitz, & Maggs, 2012), sexual behavior is a dyadic process that is relatively less studied in research on committed romantic couples. Sexual behavior has been primarily examined as a relationship process by modeling the frequency and the quality of sex, which have both been linked to relationship quality (e.g., Willoughby & Vitas, 2012; Young, Denny, Luquis, & Young, 1998). We would assert that from either a symbolic interactionism perspective (e.g., Manning & Smith, 2010) or a motivation perspective (e.g., Nowak, Vallacher, & Zochowski, 2002), it could be just as critical to know the positive (e.g., to bond) and negative (e.g., to control) meanings or motives that sexual behavior might hold in those relationships. Thus, we believe that the various meanings of sex within romantic relationships might yield unique predictive validity in explaining change over time, even after controlling for the prediction offered by frequency of sexual behavior. The current study, therefore, sought to conceptually extend the work examining sexual behavior in romantic relationships by developing a new, psychometrically optimized measure of the meanings of sexual

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behavior in romantic relationships: the Meanings of Sexual Behavior Inventory (MoSBI).

Research on Sex Motives

The current study builds on a body of work examining sex motives that has yielded a few multidimensional inventories (the SMS, Cooper, Shapiro, & Powers, 1998; the AMORE, Hill & Preston, 1996; and the YSEX?, Meston & Buss, 2007). A majority of the work using these scales has examined sex motives for casual sexual encounters, typically examining how motives for casual sex are linked to risky sexual behavior and individual outcomes (Aspden, Ingledew, & Parkinson, 2010; Chapleau & Oswald, 2010; Eastwick & Finkel, 2012; Gebhardt, Kuyper, & Greunsven, 2003; Hill, 1997; Meston, Hamilton, & Harte, 2009; Stephenson, Ahrold, & Meston, 2011). Although these scales assess a number of dimensions of sexual meaning that are likely relevant to romantic relationships (e.g., to bond, for pleasure, and to control a partner), they assess a number of motives that may be more specific to casual sex and the insecurities that might arise in that social context (e.g., having sex to conform to peer pressure, to enhance social status, to feel more physically desirable, or to achieve greater sexual experience). Although this is one of the first studies to examine similar motives/meanings of sex in committed relationships, we would argue that after the initial stages of romantic relationships, the salience of such motives would likely wane. Given their focus on casual encounters, previous researchers could likely have oversampled items reflecting casual sexual motivations, and could potentially have undersampled items more relevant to committed relationships, resulting in scales less representative of individuals in relationships.

A small number of studies have used these inventories in samples of romantic relationships to examine how sex motives are linked to relationship functioning (e.g., Davis, Shaver, & Vernon, 2004; Schachner & Shaver, 2004; Vannier & O'Sullivan, 2012). Only a few of these studies provided relationship lengths, yielding a range of 12 to 36 months in these samples (Impett, Peplau, & Gable, 2005; Impett, Gordon, & Strachman, 2008a; Impett, Stratchman, Finkel, & Gable, 2008b; Sanchez, Moss-Racusin, Phelan, & Crocker, 2011), suggesting that these studies have examined sexual motives in fairly short-term relationships. Many of these studies also emphasized being in a relationship without a focus on the level of commitment within those relationships (e.g., by combining all dating individuals into the same category regardless of their exclusivity; Birnbaum, Mikulincer, & Austerlitz, 2013; Impett et al., 2005, 2008a, 2008b; Sanchez et al., 2011). Additionally, five of these eight studies are cross-sectional (Birnbaum et al., 2013; Davis et al., 2004; Sanchez et al., 2011; Schachner & Shaver, 2004; Vannier & O'Sullivan, 2012), two of them are daily diary studies (Impett et al., 2005, 2008a), and just one study examined the predictive validity of approach (a heterogeneous mixture of positive motives) and avoidant (primarily conflict management) sexual motives over time (1 month; Impett et al., 2005). Thus, the impact of the meanings of sex in relationships over time (e.g., months or years) has yet to be extensively examined.

Advancing Previous Work

The current study sought to extend this body of sexual motivation work both conceptually and methodologically by developing a measure of the meanings of sexual behavior within romantic relationships—the MoSBI. The MoSBI extends previous work (and the previously developed inventories) in four key ways.

Including Committed Long-Term Relationships

To extend research that has often focused on motives for casual sex among single individuals to the somewhat distinct interpersonal context of romantic relationships, we developed the MoSBI specifically for use in research on couples and individuals currently in romantic relationships. The current study aims to improve on the sex motive literature by longitudinally focusing on couples with a variety of relationship lengths and commitment levels, including a diverse range of both short-term and long-term relationships.

Integrating Conceptual Frameworks

In developing the MoSBI, we sought to augment previous work grounded in motivation theory by introducing a symbolic interactionism perspective (e.g., Manning & Smith, 2010, see below), thereby integrating two rich conceptual literatures within the current study. Whereas much of the previous work examined *sex motives* (i.e., the factors driving the choice to engage in sexual behavior), symbolic interactionism conceptualizes this same phenomenon as the *meanings* of sex or *interpretations* that individuals make of their own sexual behavior (see Snow, 2001, p. 3). A central tenet of Blumer's symbolic interactionism theory is that humans interact with elements in their worlds based on the meanings they ascribe to those things (Manning & Smith, 2010), highlighting the importance of the meanings that individuals place on sexual behavior with their partners (e.g., Gecas & Libby, 1976). We would therefore argue that symbolic interactionism's focus on *meanings* ascribed to sexual activity intersects nicely with a motivational framework, as *meanings* and *motives* both likely assess a common construct representing the reasons people engage in sexual behavior (e.g., Longmore, 1998) and could, therefore, be used interchangeably. Consistent with this, Impett and colleagues (2005) used an approach-avoidance motivational framework, demonstrating that motives guide individuals' decisions to engage in sex (e.g., approaching positive outcomes like one's sexual pleasure and avoiding negative outcomes like conflict). From a symbolic interactionism perspective, those approach motives would be conceptualized as positive meanings ascribed to sexual activity (e.g., to share pleasure, to bond) whereas the avoidance motives would be conceptualized as negative meanings (e.g., to manage conflict). The current study sought to develop a scale assessing the common ground between these two theoretical orientations, examining the *motives* or *meanings* surrounding sexual activity within the context of committed romantic relationships.

Beginning With a Qualitative Foundation

Given that the meanings of sexual behavior *in relationships* could vary meaningfully from motives for casual sexual behavior, we decided to start the measurement process from scratch—con-

ducting a qualitative pilot study to generate a diverse item pool (see below) and then recruiting a large online sample of individuals in committed romantic relationships representing a broad range of lengths to evaluate the item pool and develop the MoSBI. This process provided the possibility of discovering a more diverse array of meanings of sexual behavior relevant to both short-term and long-term romantic relationships, likely uncovering dimensions of meaning that could have been missing from previous measures.

Linking Sexual Behavior Meanings to Current Relationship Functioning

As the current investigation characterized meanings of sexual behavior as ongoing relationship processes, it sought to examine the direct links between various meanings of sexual behavior and current relationship functioning—specifically relationship satisfaction. This helped to more firmly link the current investigation with the larger literature on romantic relationships. Consistent with these analyses, a review of recent work on symbolic interactionism asserted ". . . the sexual things people do are far less important than the meanings those sexual things have for those people" (Waskul & Plante, 2010, p. 149). Thus, the current study sought to examine that assertion directly by evaluating predictive links between meanings of sexual behavior in relationships and change in relationship satisfaction over time after controlling for the prediction offered by frequency of sexual behavior.

The Current Study

To create the MoSBI, we first developed a set of 104 items from 2,930 open-ended responses of 376 online respondents in a pilot study. We then gave that item pool to 3,003 online respondents and ran an extensive set of analyses to develop and validate the MoSBI. As a majority of the previous work on meanings of sex in relationships has been cross-sectional or retrospective, we sought to build on this by collecting 2-month follow-up data from 862 respondents. This allowed us to evaluate the unique predictive validity of the MoSBI subscale scores to predict change in relationship quality over 2 months.

Hypothesis 1: We predicted that, consistent with previous measurement work in this area, multiple positive and negative dimensions of the meanings of sexual behavior would be evident within romantic relationships.

However, by narrowing our focus to individuals in romantic relationships, we more specifically hypothesized that unique dimensions of meaning would emerge beyond those examined in the previous literature that largely focused on explaining casual sexual encounters.

Hypothesis 2: Consistent with symbolic interactionism, we expected that even after controlling for frequency of sexual behavior, the positive and negative dimensions of meanings of sexual behavior would predict residual increases and decreases (respectively) in relationship satisfaction over time.

Method

Participants

In total, 3,003 respondents currently in sexually active romantic relationships completed an online survey. The participants were predominantly female (65%) and White (75%) with 5.4% being Black, 6.2% Latino, 8.0% Asian, and 5.4% other/multiracial. The mean age was 27.2 years old ($SD = 9.4$). The median income was $15,000 per year. A majority of the participants attended some type of college (46% some college or trade school, 29% bachelor's degree, 12% graduate degree) while 13% completed high school or less. A majority of the respondents (57%) were dating exclusively (for an average of 1.8 years, $SD = 2.3$), with 29% married (together for an average of 10.4 years, $SD = 8.2$ and married an average of 7.8 years, $SD = 8.5$), 8.3% engaged (together an average of 3.4 years, $SD = 3.0$), and 6.6% dating casually (dating more than one person for an average of 0.7 years, $SD = 1.2$). The sample was modestly happy with mean relationship satisfaction (CSI-16; Funk & Rogge, 2007) scores of 62.8 (on a 0 to 81 scale, $SD = 13.9$) for exclusively dating participants, 60.0 ($SD = 16.8$) for married participants, 65.9 ($SD = 13.5$) for engaged participants, and 49.4 (SD 14.0) for casually dating participants. Using a cut score of 51.5 for identifying clinically meaningful relationship dissatisfaction (see Funk & Rogge, 2007), the CSI-16 scores revealed that 53% of the casually dating, 19% of the exclusively dating, 14% of the engaged, and 25% of the married respondents were significantly dissatisfied in their relationships, suggesting that the sample contained relationships representing a wide range of relationship quality.

Procedure

Recruitment. All procedures and materials for this study were approved by an Institutional Review Board. Respondents had to be at least 18 years of age and currently in sexually active romantic relationships to participate. The survey was presented online via SurveyGizmo.com and took approximately 20–25 min to complete. Participants were recruited from online websites (40%; e.g., Craigslist, University of Hanover, and TheNest.com), the Mechanical Turk service of Amazon.com (32%), the psychology undergraduate subject pool (20%), and recommendations from other participants (8.4%). All respondents received feedback on their relationships at the end of the initial survey as the primary recruitment incentive. Respondents who participated through Mechanical Turk (Mturk) also received $0.20 to $0.40 of store credit for Amazon.com, while respondents from the undergraduate subject pool received extra credit toward their psychology courses.

Initial assessment. Respondents participated in a 25–30 min online survey containing a 104-item pool of potential items as well as measures assessing conceptually distinct constructs serving as theoretical boundaries for the new measure.

Two-month follow-up. Participants were given the opportunity to provide email addresses in the initial survey so that they could be invited to complete an optional 2-month follow-up assessment, and 2,978 respondents (97%) provided their email addresses. They were sent a series of up to four invitations to complete the follow-up (spaced roughly 7 days apart), and 862 participants (29% of those providing email addresses) did so. The

follow-up participants were predominantly female (70.8%) and White (79.8%) with 4.6% Black, 4.7% Latino, 5.3% Asian, and 5.7% other/multiracial. The mean age was 29.1 years old ($SD = 10.7$). The median income was $15,000 per year. A majority of the participants attended some type of college (39% some college or trade school, 33% bachelor's degree, and 17.9% graduate degree) while 10% completed high school or less. A majority of the respondents (53.6%) were dating exclusively (for an average of 2 years, $SD = 2$), with 32.9% married (together for an average of 11.8 years, $SD = 9.5$), 8.1% engaged (together an average of 3.4 years, $SD = 2.4$), and 5.3% dating casually (dating more than one person for an average of 0.8 years, $SD = 1.2$).

Analysis of variance (ANOVA) analyses failed to uncover any relationship satisfaction (CSI) or sexual satisfaction (QSI-pos) differences between participants providing follow-up data and those who did not. The analyses did reveal small demographic differences suggesting that the participants providing follow-up responses tended to be slightly older, $F(2974) = 7.33$, $p < .001$, $d = 0.30$, with somewhat higher levels of education, $F(2991) = 7.51$, $p < .001$, $d = 0.30$, and income, $F(2864) = 2.74$, $p < .01$, $d = 0.11$, and slightly longer relationships, $F(2981) = 5.14$, $p < .001$, $d = 0.21$. Additionally, those who completed the follow-up were less likely to be male ($\chi^2(1, N = 3,003) = 18.45$, $p < .001$; 29% in people giving follow-up vs. 38% in people not giving follow-up), less likely to be dating ($\chi^2(1, N = 3,003) = 8.74$, $p < .01$; 59% vs. 65%), and more likely to be white ($\chi^2(1, N = 2,994) = 17.95$, $p < .001$; 80% vs. 72%). As evidenced by the Cohen's d statistics, these demographic differences were generally small in magnitude, emerging as statistically significant because of the large amount of power afforded by the sample size.

Measures

Meanings of sexual behavior in relationships. In an effort to diversify and enrich the assessment of roles that sexual behavior can play in romantic relationships, the survey included a 104-item pool of potential meanings of sexual behavior in relationships. These items were generated from 2,930 open-ended responses from 376 respondents in an earlier online study: 67% female, 70% White, 16% completing high school or less, 20% married, 5.2% engaged, 75% dating, in their relationships an average of 3.7 years. We wrote the items to: (a) be brief and straightforward, (b) make use of respondents' own language as much as possible, (c) require not higher than an 8th grade reading level, (d) fairly represent the diversity of responses obtained (i.e., creating an item whenever a handful of respondents wrote comparable answers), (e) present a balanced set of both positive and negative potential meanings, and (f) avoid excessive redundancy. We also aimed to keep the items focused on meanings of sexual behavior, actively screening out any verbiage that might link those meanings to relationship quality or hint at their impact on relationships. Thus, we avoided using open-ended responses like "In my current relationship, sex allows me to feel satisfied" as we worried that such items confound the assessment of the meanings of sex with their impact on relationships. Although many of these respondent-generated items mapped onto conceptual dimensions present in previous scales (e.g., using sexual behavior to bond), notable differences emerged from the previous measurement work. First, some dimensions from the existing measures failed to emerge in the context of committed

romantic relationships (e.g., coping, peer pressure, and experience seeking), likely because they tend to be less relevant to this population. Second, items emerged that failed to map onto any of the conceptual dimensions of existing measures. Taken together, these results underscored the utility of starting the measurement process with a respondent-generated item pool, as it yielded a new conceptual perspective on the meanings of sexual behavior. In the current study, the positive items were all presented with the stem, "*In your relationship, how often do you use sexual activity . . .*" and the negative items were presented with the stem, "*In your relationship, how often do you use sexual activity (or withholding sexual activity) . . .*" No time-frame was specified for these items. Respondents answered these items on a 6-point response scale ($1 = never$, $2 = rarely$, $3 = occasionally$, $4 = about half the time$, $5 = most of the time$, and $6 = all of the time$). Once the final items of the MoSBI subscales were identified, responses for each subscale were averaged so that higher scores reflected higher levels of that meaning of sexual behavior ($\alpha_{bond} = .90$, $\alpha_{share-pleasure} = .89$, $\alpha_{learn} = .94$, $\alpha_{energize} = .91$, $\alpha_{de-stress} = .92$, $\alpha_{manage-conflict} = .94$, $\alpha_{incentive} = .93$, $\alpha_{control} = .92$, $\alpha_{express-anger} = .90$). Based on the higher order EFA, the five positive and four negative subscales were then averaged into composites ($\alpha_{positive-meanings} = .87$, $\alpha_{negative-meanings} = .86$).

Relationship functioning scales. To evaluate the discriminant validity of the MoSBI scale scores (ensuring they indeed represent novel constructs in the couples literature), we included a series of scales measuring common appetitive and aversive relationship processes in the couples literature that are known to influence relationships over time: ***relationship satisfaction*** (the 16-item Couples Satisfaction Index, CSI-16; Funk & Rogge, 2007; $\alpha = .97$), ***sexual satisfaction*** (the 12-item Quality of Sex Inventory satisfaction subscale, QSI-pos; Shaw & Rogge, 2016; $\alpha = .96$), ***sexual dissatisfaction*** (the 12-item Quality of Sex Inventory satisfaction subscale, QSI-neg; Shaw & Rogge, 2016; $\alpha = .95$), ***negative conflict behavior*** (4 items, "*Swear at your partner*," "*Yell and scream at your partner*," "*Use profanity toward your partner*," "*Purposefully insult your partner*"; $\alpha = .89$), ***emotional support*** (4 items of the Support in Intimate Relationships Rating Scale—SIRRS; Dehle, Larsen, & Landers, 2001; "*Said he/she thought I handled a situation well*," "*Expressed confidence in my ability to handle a situation*," "*Said it was OK to feel the way I was feeling*," "*Took my side when discussing a situation*"; $\alpha = .91$), ***frequency of and desire for physical affection*** (5-items assessing both frequency of behavior and desired levels over 2 weeks; "*Cuddling*," "*Holding one another*," "*Deep kissing*," "*Kissing/caressing nongenital areas of partner's body*," "*Partner kissing/caressing nongenital areas of your body*"; $\alpha_{frequency} = .94$; $\alpha_{desired-amount} = .93$), ***frequency of and desire for sexual behavior*** (5 items assessing both frequency of behavior and desired levels over 2 weeks; "*Giving oral sex*," "*Receiving oral sex*," "*Vaginal and/or anal sex*," "*Climaxing with partner*," "*Partner climaxing with you*"; $\alpha_{frequency} = .90$; $\alpha_{desired-amount} = .92$), and ***physical attraction to partner*** (1 item; "*How physically attractive do you find your partner?*"). Items were given on 6 or 7-point response scales (e.g., *not at all* to *extremely*), and were summed so that higher scores indicated higher levels of the construct being assessed.

Individual sexual functioning. To further evaluate the discriminant validity of the MoSBI scale scores, we included two

constructs common to the larger literature on sexuality: ***Sociosexual orientation*** (9-item Socio-Sexual Orientation Inventory; SOI; Penke & Asendorpf, 2008) assessed attitudes toward causal sex ("*Sex without love is OK*") desires for casual sex ("*How often do you have fantasies about having sex with someone you are not in a committed romantic relationship with?*") and experience with casual sex ("*With how many different partners have you had sexual intercourse on one and only one occasion?*"); α = .85). ***Sex drive*** was assessed with 4 items: "*I tend to be horny most of the time,*" "*I find myself craving sex often,*" "*My mind often wanders to sex,*" "*I can get turned on very quickly*"; α = .90).

Attention and effort. We used the Attentive Responding Scale (ARS; Maniaci & Rogge, 2014) to identify respondents failing to provide sufficient attention and effort. The ***Inconsistency*** subscale of the ARS consisted of five pairs of highly similar items (e.g., "I am an active person," "I have an active lifestyle"), with one member of each pair presented near the beginning of the survey and the other presented near the end of the survey. Absolute differences between paired responses were summed so that higher scores indicated greater inconsistency. The ***Infrequency*** subscale of the ARS consisted of 6 items with extremely skewed response distributions (e.g., "I enjoy receiving telemarketers' calls"). Responses were summed so that higher scores indicated increasingly unlikely inattentive responding. Participants scoring above 10 on the inconsistency subscale or 11 on the infrequency subscale were considered to have not paid sufficient attention and were excluded from remaining analyses.

Data Cleaning

In total, 3,130 respondents in romantic relationships completed at least 70% of the initial survey. Before data analysis, the data set was subjected to two main steps of data cleaning. First, 112 (3.6%) of the initial respondents were identified as invalid, because of lack of effort or attention, using the ARS. Second, 15 (0.5%) of the remaining responses were identified as multivariate outliers on a set of 5 demographic and 10 substantive variables, using Mahalanobis distances as outlined by Tabachnick and Fidell (2001), and were excluded from further analyses.

Results

Evaluating the Item Pool

Conceptual and analytic approach. Consistent with previous measurement work in this area (e.g., Cooper et al., 1998; Hill & Preston, 1996; Meston & Buss, 2007), the current study conceptualized meanings of sex in romantic relationships as a heterogeneous phenomenon representing an array of specific meanings/motives likely to form correlated yet meaningfully distinct dimensions. Furthermore, in line with research suggesting that many processes can be organized into basic appetitive and aversive behavioral dimensions (see Gable, Reis, & Elliot, 2003), we hypothesized that the various dimensions of meaning might organize into higher-order positive and negative composites. Thus, we sought to develop a multidimensional scale with a handful of optimized items assessing each dimension of meaning. Toward this end, we used Exploratory Factor Analyses (EFA) to identify the basic dimensions of meaning within our item pool and a second

EFA on those dimensions to identify higher order factors. These EFAs identified pools of items that were then subjected to Item Response Theory (IRT) analyses, allowing us to identify the 4–5 items that most effectively assessed each dimension (in a nonredundant manner), thereby creating the MoSBI. This combination of EFA and IRT aligned perfectly with our goal of creating a set of fairly focused subscales. With high levels of internal consistency and face validity, as well as optimized abilities to discriminate among respondents, the MoSBI subscale scores would be able to offer researchers maximized levels of variance and precision (e.g., detecting meaningful differences among individuals) while remaining fairly short.

Identifying the nine dimensions of the MoSBI. As a first step in developing the MoSBI, we used exploratory factor analysis (EFA) in one random half of the sample (*n* = 1,490) to objectively determine the underlying correlational structure that existed within our pool of 104 items while retaining the second half of the sample (*n* = 1,513) to cross-validate that structure once the items of the MoSBI had been identified. Before running the factor analyses, we examined the distributions of the 104 items in our pool and excluded 16 items because of low variance (i.e., fewer than 20% of respondents endorsed them). We ran a preliminary EFA using principle axis factoring with Oblimin rotation on the remaining 88 items. The scree plot and Kaiser-Guttman criteria suggested a 9-factor solution and identified another 6 items that were worded so globally that they cross-loaded on numerous factors. Excluding the six excessively cross-loading items, we ran an EFA on the remaining 82 items using principle axis factoring with an Oblimin rotation strategy (allowing for correlated factors), extracting 10 factors (that accounted for 67.2% of the variance and including an extra factor to absorb stray items), yielding nine robust factors (further confirming our choice to extract 10 factors so as not to miss any meaningful dimensions). Table 1 presents the pattern coefficients for these nine factors, specifically for the 4–5 most effective items for assessing each factor (as identified by the IRT analyses below) that made it onto the MoSBI scale.

Comparing the item content of the nine MoSBI dimensions with the item content of existing sex motives measures (e.g., the AMORE, the SMS, and the YSEX?) revealed that a number of the dimensions that emerged were conceptually similar to subscales of measures developed in the casual sex literature. For example, the MoSBI bonding item "*How often do you use sexual activity to bond*" shares similar content to the AMORE Emotional Value for One's Partner item "*The sense of emotional bonding with my partner during sexual intercourse is an important way of feeling close to him or her,*" the SMS Intimacy item "*I have sex to feel emotionally close to my partner,*" and the YSEX? Love and Commitment item "*I wanted to increase the emotional bond by having sex.*" Similarly, the MoSBI subscales to de-stress, to share pleasure, as an incentive, to express anger, and to control partner shared highly similar item content to subscales of previous measures. However, consistent with Hypothesis 1, our comparison of item content suggested that several new dimensions emerged by focusing on the meanings of sex within romantic relationships. Specifically, factors 4 (to energize one's relationship), 5 (to learn more about each other), and 6 (to manage conflict) all emerged as new dimensions. In addition, some of the dimensions from existing measures failed to emerge in the context of committed romantic relationships (e.g., coping, peer pressure, and experience seeking),

Table 1
Pattern Coefficients for the MoSBI Items From the Exploratory Factor Analysis in the First Random Sample Half (n = 1,490)

In your relationship how often do you use sexual activity (or withholding sexual activity) . . .	Pattern coefficients for items of MoSBI scale								
	1	2	3	4	5	6	7	8	9
Factor 1: To share pleasure									
1. To share pleasure	**.77**	.13	.06	−.01	.00	.02	−.03	−.02	.02
1. To have fun together	**.69**	.07	.08	.12	.03	.00	−.03	.02	−.01
1. To satisfy our desires	**.65**	.01	.08	.11	.02	−.02	.04	−.04	.00
1. To enjoy time together	**.53**	.25	.09	.09	.08	.00	−.03	−.02	−.02
Factor 2: To bond									
2. To show love	.34	**.53**	−.01	.08	.06	.04	.03	.06	−.06
2. To bond	.20	**.52**	.04	.04	.26	.00	.01	−.03	.03
2. To stay connected	.09	**.48**	.09	.25	.11	.03	.00	−.01	−.04
2. To strengthen our relationship	.09	**.47**	.05	.17	.24	.03	.01	−.05	−.02
2. To build intimacy	.21	**.43**	−.03	.27	.19	.02	−.01	.01	.01
Factor 3: To de-stress									
3. To de-stress	−.01	.04	**.88**	−.01	−.02	.00	−.01	.04	.02
3. To relieve stress	−.01	.00	**.86**	−.02	.06	−.01	−.02	−.01	.03
3. To release tension	.01	.00	**.80**	.00	−.04	.06	−.01	.03	−.01
3. To unwind	.09	−.01	**.79**	.02	.01	−.03	.03	−.05	.03
3. To relax	.16	−.01	**.63**	.06	.12	−.07	.01	−.01	.01
Factor 4: To energize the relationship									
4. To liven things up	.05	.00	.14	**.72**	.01	.02	.01	.00	.07
4. To spice things up	.12	−.09	.12	**.68**	.08	−.01	.06	.03	−.02
4. To keep things interesting	.12	−.07	.10	**.66**	.10	.00	.04	.02	−.04
4. To keep your relationship exciting and new	.14	−.01	−.02	**.65**	.14	.05	−.01	−.03	.03
4. To energize your relationship	.03	.20	.09	**.60**	.09	.00	−.04	−.01	.04
Factor 5: To learn more about each other									
5. To find out more about each other	.01	−.03	.04	.02	**.86**	.04	−.03	.01	.06
5. To learn more about each other	.03	.01	.04	.02	**.83**	.00	−.01	.02	.01
5. To discover new things about each other	.09	−.12	−.04	.12	**.83**	.02	−.01	.01	−.02
5. To grow to know each other better	.07	.14	.00	.00	**.76**	−.02	.04	−.01	−.02
5. To understand each other better	−.03	.13	.08	.04	**.74**	−.01	−.02	.01	.00
Factor 6: To manage conflict									
6. To get over a fight	.02	.03	.01	−.02	−.03	**.91**	.01	.01	.01
6. To patch things up after a fight	.06	.01	.00	.00	−.03	**.90**	−.03	.01	.07
6. To make up	.03	.01	.01	.01	.05	**.85**	−.04	.05	−.01
6. To stop fighting	−.02	−.03	.02	.00	.03	**.80**	.06	.03	.02
6. To resolve conflicts	−.03	.01	.08	.03	.02	**.79**	.04	−.01	.01
Factor 7: As an incentive									
7. As an incentive to get something	−.02	.02	.02	.02	−.03	.05	**.72**	.04	.11
7. To get something that you want	−.07	.04	.03	.03	−.03	.05	**.69**	.01	.19
7. As a bribe for your partner	−.04	.01	.05	.03	−.04	.01	**.66**	.11	.10
7. As a bargaining chip	−.09	.03	.00	.04	−.05	.02	**.57**	.13	.21
7. To get your partner to agree with you	−.06	.01	.00	.03	.01	.11	**.52**	.15	.19
Factor 8: To express anger									
8. To make it clear that you're mad	.01	.00	.01	.00	.00	.06	.03	**.78**	−.04
8. To show that you're upset	.00	.01	.01	−.02	−.01	.10	.06	**.76**	−.04
8. To frustrate your partner	−.02	−.04	.02	.00	.04	.01	.16	**.59**	.21
8. To punish	−.02	−.02	−.01	.07	−.03	.02	.03	**.56**	.29
8. To get your partner to leave you alone	−.15	.07	.01	.02	−.04	−.01	.09	**.42**	.10
Factor 9: To control a partner									
9. To dominate your partner	*.02*	*.00*	*.05*	*−.01*	*.01*	*.03*	*.02*	*.02*	**.78**
9. To show your partner who is boss	.00	−.01	.00	.01	.02	.08	.11	.00	**.75**
9. To show your power	.01	−.01	.02	.01	.02	.02	.06	.01	**.73**
9. To assert control	.02	−.04	.05	−.01	.00	.03	.10	.03	**.69**

Note. To facilitate presentation, only the items ultimately selected for the MoSBI scale (by Item Response Theory analyses) are presented, but this Exploratory Factor Analyses was conducted on an 82-item pool. The strongest semi-partial correlations for each item are bolded to facilitate interpretation. Respondents answered these items on the same 6-point scale: 1 = *never*, 2 = *rarely*, 3 = *occasionally*, 4 = *about half of the time*, 5 = *most of the time*, 6 = *all of the time*. MoSBI = Meanings of Sexual Behavior Inventory.

perhaps because they tend to be less relevant to this population. Thus, the current investigation was able to identify (and develop optimized scales for) several new dimensions of meaning that had not been examined in the previous literature.

Selecting the items of the MoSBI. The large size of the current sample allowed us to use IRT (Hambleton, Swaminathan, & Rogers, 1991) to select the items of the MoSBI. IRT is a large-sample statistical technique that offers a notably greater level

of precision in creating scales over traditional correlational techniques like factor analysis (see Funk & Rogge, 2007; Hambleton et al., 1991), serving to augment those traditional approaches when added to the item selection process (see Clark & Watson, 1995). Although extremely effective at optimizing the properties of scales (e.g., Fraley, Waller, & Brennan, 2000; Funk & Rogge, 2007), thereby offering the possibility of creating scales that provide greater power to detect change over time and treatment effects (e.g., Rogge, Crasta, Maniaci, Funk, & Lee, 2015), IRT is far less commonly used in the psychology literature due in part to the large samples and extra effort required. To take advantage of the benefits of IRT in measure development, each set of items corresponding to a dimension of meaning was subjected to a separate IRT analysis using the Graded Response Model (appropriate to evaluate items with Likert response scales; Samejima, 1997) in Multilog 7.0 (Thissen, Chen, & Bock, 2002). These IRT analyses were used to identify the 4–5 items for each factor that were most effective at assessing that dimension (i.e., offering the most information with the lowest levels of measurement error), thereby developing psychometrically optimized subscales. Table 1 presents the items selected for each factor.

Ensuring the stability of the MoSBI dimensions across men and women. To ensure that the factor structure of the MoSBI scale did not differ by gender, we also ran separate EFAs on the final MoSBI items in the 515 men and the 975 women in that sample half. These analyses suggested nearly identical factor structures in men and women, offering initial evidence to suggest that the MoSBI scales operate similarly in men and women.

Examining the higher order structure of the MoSBI dimensions. We ran a final EFA on the MoSBI subscales within that same sample half to look for a higher order structure (still using principle axis factoring with Oblimin rotation). The scree plot and the Kaiser-Guttman criteria supported a two-factor solution, accounting for 65.5% of the variance. As seen in Table 2, the subscales of using sexual behavior to bond with partners, to energize relationships, to learn more about one's partner, to share pleasure with a partner, and to de-stress all loaded strongly on a

dimension representing positive uses of sexual behavior. This suggests that in addition to using each of those subscales as distinct constructs in their analyses (a strategy that could often yield meaningfully different results across the scales), researchers could also collapse those five scales into a composite reflecting overall positive meanings (a strategy particularly appropriate in the instances when the five separate scales yield identical results). Similarly, the dimensions of using sexual behavior as an incentive to get something from one's partner, to express anger, to control one's partner, and to manage conflict in the relationship all loaded on a dimension representing negative uses of sexual behavior. This suggests that in addition to using each of those subscales as distinct constructs in their analyses (a strategy that could often yield meaningfully different results across the scales), researchers could also collapse those four scales into a composite reflecting overall negative meanings (again, a strategy particularly appropriate in the instances when the four separate scales yield identical results). Thus, the MoSBI scales not only offer relationship researchers a more comprehensive (and psychometrically optimized) multidimensional measure of the meanings of sexual behavior in romantic relationships, but these higher-order EFA findings also offer researchers the option of either using all nine dimensions as distinct constructs in their analyses (offering a more fine-grained approach) or of collapsing the subscales into overall positive and negative dimensions (offering a more global view of the correlates of these meanings).

Cross-validating MoSBIs factor structure. To ensure that the final items of the MoSBI still conformed to the factor structure observed in the full item pool, we built CFA models on the 43 MoSBI items in the second random sample half ($N = 1,513$). The CFA model with nine latent subscales loading onto two higher order latent factors demonstrated adequate fit ($\chi^2 = 3,886$, comparative fit index [CFI] = .943, root mean square error of approximation [RMSEA] = .049, standardized root mean square residual [SRMR] = .100) whereas models testing simpler structures demonstrated notably poorer fit: nine subscales with one higher order factor ($\chi^2 = 7,308$, CFI = .879, RMSEA = .071, SRMR = .192), two higher order factors with no subscales ($\chi^2 = 17,466$, CFI = .689, RMSEA = .113, SRMR = .118), and one global factor with no subscales ($\chi^2 = 33,718$, CFI = .385, RMSEA = .159, SRMR = .230). Thus, the CFA results in the second random half of the sample continued to support the hierarchical structure uncovered by EFA in the first random half of the sample. This offers a cross-validation of that correlational structure in a large sample, suggesting that the factor structure of the MoSBI is likely to continue to replicate in future studies.

Generalizability of the MoSBI subscales across diverse subsamples. Taking advantage of the size and diverse nature of the sample, we computed Cronbach's α coefficients across a wide range of demographic subsamples to explore how well the MoSBI subscales function across these various groups. As seen in Table 3, the MoSBI subscale scores demonstrated high levels of internal consistency across all demographic subsamples tested.

Rates of meanings endorsed across gender and relationship stages. Table 4 presents the means and standard deviations of the MoSBI subscales across men and women. A 3 × 2 multivariate analysis of variance (MANOVA) on the positive subscales suggested significant multivariate differences across gender, $F(5, 2299) = 7.13$, $p < .001$ and relationship stage, $F(10,4600) =$

Table 2
Pattern Coefficients From the Higher-Order Exploratory Factor Analysis

MoSBI subscales	Higher order factors	
	Positive	Negative
Positive uses		
2. To bond with partner	**.87**	.13
4. To energize the relationship	**.86**	.08
5. To learn more about each other	**.79**	.06
1. To share pleasure	**.77**	−.19
3. To de-stress	**.59**	.21
Negative uses		
7. As an incentive	−.04	**.91**
8. To express anger	−.11	**.87**
9. To assert control	−.03	**.85**
6. To manage conflict	.25	**.52**

Note. Pattern coefficients greater than .4 have been bolded to facilitate interpretation. The numbers in front of each subscale label refer to the corresponding factor numbers in Table 1. MoSBI = Meanings of Sexual Behavior Inventory.

Table 3

Examining Internal Consistencies of the MoSBI Subscales Across Meaningful Subsamples

Statistic BY sub-sample	Sub-sample N	Cronbach's α coefficients										
		Share pleasure	Bond	De-stress	Energize	Learn	Positive comp	Manage conflict	Incentive	Express anger	Control	Negative comp
BY gender												
Women	1,898	.90	.90	.92	.91	.94	.96	.94	.92	.87	.91	.94
Men	1,027	.88	.90	.92	.92	.94	.96	.94	.94	.93	.92	.95
BY living arrangements												
Living with partner	1,412	.91	.92	.93	.92	.95	.97	.94	.93	.89	.93	.94
Living separately	1,311	.87	.89	.91	.90	.94	.95	.95	.93	.91	.91	.95
Long-distance relationships	267	.82	.83	.90	.90	.94	.94	.93	.93	.89	.90	.95
BY race/ethnicity												
White	2,230	.89	.90	.92	.91	.94	.96	.94	.92	.88	.91	.94
Asian	239	.88	.90	.89	.91	.93	.96	.93	.92	.92	.92	.96
Hispanic/Latino	187	.90	.91	.91	.92	.95	.96	.94	.91	.89	.90	.93
Black	163	.90	.91	.93	.91	.94	.96	.94	.95	.92	.93	.96
BY relationship stage												
Married	861	.90	.92	.93	.92	.94	.96	.94	.93	.88	.92	.94
Engaged	249	.91	.92	.91	.93	.95	.97	.95	.95	.93	.92	.96
Dating	1,893	.88	.89	.91	.90	.94	.95	.94	.92	.90	.91	.95
BY education level												
High school or less	394	.89	.90	.90	.91	.95	.96	.94	.93	.92	.94	.95
Some college/trade school	1,368	.89	.90	.92	.92	.94	.96	.95	.92	.88	.91	.94
Bachelor's degree	867	.88	.90	.92	.90	.93	.96	.93	.93	.91	.91	.95
Graduate degree	364	.91	.91	.90	.91	.95	.96	.94	.94	.89	.92	.95
BY sexual orientation												
Heterosexual	2,820	.89	.90	.92	.91	.94	.96	.94	.93	.90	.92	.95
Gay males	64	.91	.91	.90	.90	.93	.96	.95	.92	.95	.84	.96
Lesbians	119	.87	.89	.93	.94	.96	.96	.92	.92	.80	.91	.92

Note. Positive comp = composite of positive subscales; negative comp = composite of negative subscales; MoSBI = Meanings of Sexual Behavior Inventory.

14.60, $p < .001$ but failed to identify a significant interaction (set at $p < .01$ to account for Type 1 error). Subsequent univariate ANOVAs suggested that women endorsed using sex to bond at slightly higher levels than men ($F(1,2973) = 9.68$, $p < .002$; Cohen's $d = .19$), and that married respondents endorsed all five positive dimensions at slightly lower levels than engaged respondents (F statistics ranging from 5.54 to 42.94 and Cohen's d's ranging from .17 to .26) or dating respondents (Cohen's d's ranging from .13 to .40). A similar 3×2 MANOVA on the negative subscales again suggested main effects for gender, $F(4, 2933) = 10.74$, $p < .001$ and relationship stage, $F(8,5868) = 6.44$, $p < .001$. Subsequent ANOVAs suggested that men endorsed using sex to manage conflict and control their partners at slightly higher levels than women ($F_{\text{manage-conflict}}(1,2935) = 11.14$, $p < .001$, $d = .18$; $F_{\text{control}}(1,2935) = 24.71$, $p < .001$, $d = .26$), and that married respondents endorsed using sex to manage conflict, to control their partners, and as an incentive at slightly lower levels than engaged or dating respondents (F statistics of 7.56, 15.12, and 10.87, respectively, all $p < .001$; Cohen's d's ranging from .16 to .23). The modest gender differences that emerged in these exploratory analyses are consistent with previous research using existing measures of sexual motives (e.g., Cooper et al., 1998; Hill & Preston, 1996; Meston & Buss, 2007) and suggests that motives might vary across gender roles in relationships. To our knowledge, this is the first study to explore differences in motives across relationship stages. The findings begin to suggest that motives might change meaningfully over time as couples progress into higher levels of commitment.

Discriminant validity of the MoSBI scale scores. To clearly delineate the constructs being measured by a set of subscales, it is critical to evaluate the limits of what they are measuring by showing that scores on those scales demonstrate appropriately moderate links to scores on measures of related yet conceptually distinct scales (i.e., discriminant validity; see Clark & Watson, 1995). This ensures, for example, that none of the MoSBI negative meaning subscales are more simply measures of sexual dissatisfaction or desire for more sex from a partner or that the MoSBI subscale of sharing pleasure was not inadvertently a measure of affection or sexual satisfaction. In fact, Cronbach and Meehl (1955) compellingly argued that researchers most fully demonstrate the construct validity of the scores on a scale (ensuring that they represent the construct the scale was designed to assess) by demonstrating its discriminant links to anchor scales in the nomological net, a web of conceptually distinct constructs that have been theoretically and/or empirically linked to the construct being measured by the scale. Campbell and Fiske (1959) extended this same argument when they encouraged researchers to examine discriminant validity as a critical part of the measure validation process. Thus, we evaluated the discriminant validity of the MoSBI subscale scores by examining how they correlated with one another and how they correlated with conceptually distinct yet closely related constructs from the existing literature. These constructs were chosen to represent key appetitive and aversive processes in the couples and sexuality literatures that are known to influence individual and relationship functioning over time.

Table 4
Descriptive Statistics and Correlations Among Measures

MoSBI scales	Poss. range	In men (n = 1,055) M	SD	In women (n = 1,948) M	SD	1	2	3	4	5	6	7	8	9	10	11
1. POS: To share pleasure	0–20	14.62	4.31	15.22	4.32	—	**.73**	**.44**	**.63**	**.51**	**.77**	**.08**	−.06	−**.13**	−.06	−.04
2. POS: To bond with partner	0–25	15.98	6.19	17.16	6.00	**.74**	—	**.44**	**.73**	**.71**	**.87**	**.22**	.01	−.03	.01	**.08**
3. POS: To de-stress	0–25	12.65	6.23	11.82	6.21	**.43**	**.43**	—	**.62**	**.51**	**.74**	**.49**	**.25**	**.16**	**.23**	**.36**
4. POS: To energize the relationship	0–25	13.56	6.38	13.78	6.25	**.62**	**.68**	**.57**	—	**.71**	**.90**	**.39**	**.19**	**.10**	**.17**	**.27**
5. POS: To learn about each other	0–25	11.61	7.09	12.12	7.13	**.56**	**.71**	**.49**	**.72**	—	**.86**	**.38**	**.18**	**.14**	**.17**	**.28**
6. Positive composite	0–120	68.81	24.94	70.60	24.32	**.79**	**.86**	**.73**	**.88**	**.86**	—	**.39**	**.15**	**.07**	**.14**	**.25**
7. NEG: To manage conflict	0–25	6.44	6.26	5.39	5.77	.05	**.14**	**.45**	**.31**	**.26**	**.31**	—	**.52**	**.45**	**.45**	**.77**
8. NEG: As an incentive	0–25	2.39	4.46	1.93	3.70	−**.07**	−.03	**.19**	**.11**	**.06**	**.07**	**.47**	—	**.83**	**.81**	**.91**
9. NEG: To express anger	0–25	2.07	4.30	1.86	3.45	−**.14**	−**.07**	**.12**	.03	.01	−.01	**.39**	**.74**	—	**.77**	**.87**
10. NEG: To assert control	0–20	2.00	3.92	1.17	2.83	−.04	−.03	**.18**	**.12**	**.12**	**.09**	**.38**	**.75**	**.74**	—	**.86**
11. Negative composite	0–95	12.90	15.98	10.31	12.77	−.05	.03	**.33**	**.21**	**.16**	**.17**	**.78**	**.87**	**.82**	**.81**	—

Correlations with MoSBI scales

Conceptual boundary scales	Poss. range	M	SD	M	SD	1	2	3	4	5	6	7	8	9	10	11
Relationship satisfaction	0–81	60.43	15.07	61.92	15.18	**.43**	**.43**	**.12**	**.30**	**.32**	**.38**	−**.10**	−**.14**	−**.20**	−**.15**	−**.17**
Sexual satisfaction	0–60	40.47	15.05	41.45	15.11	**.61**	**.50**	**.27**	**.44**	**.45**	**.54**	.04	−**.09**	−**.16**	−**.07**	−**.07**
Frequency of physical affection	0–65	32.58	18.86	35.40	19.72	**.34**	**.31**	**.13**	**.22**	**.28**	**.30**	.03	−.05	−**.07**	−.03	−.03
Physical attraction to partner	1–6	4.90	1.11	4.95	1.04	**.38**	**.35**	**.13**	**.26**	**.29**	**.34**	−.01	−**.16**	−**.22**	−**.16**	−**.15**
Emotional support	0–28	13.30	7.55	12.58	8.00	**.19**	**.21**	**.13**	**.18**	**.25**	**.23**	.03	−**.08**	−**.08**	−.05	−.04
Libido	0–16	10.76	3.58	8.60	4.40	**.26**	**.23**	**.28**	**.22**	**.26**	**.30**	.03	−**.06**	−**.07**	.03	−.02
Sexual dissatisfaction	0–60	6.82	10.65	4.95	9.39	−**.47**	−**.34**	−**.08**	−**.22**	−**.19**	−**.29**	**.22**	**.41**	**.50**	**.40**	**.44**
Negative conflict	0–20	4.30	4.63	4.26	4.21	−**.15**	−**.09**	**.11**	.00	−**.13**	−**.06**	**.29**	**.30**	**.29**	**.22**	**.32**
Socio-sexual orientation	9–73	39.73	14.51	30.58	13.27	−**.13**	−**.16**	**.13**	−**.06**	−**.09**	−**.07**	**.12**	**.22**	**.18**	**.22**	**.21**
Frequency of sexual activity	0–65	17.34	14.19	17.16	14.28	**.31**	**.26**	**.25**	**.28**	**.30**	**.34**	**.22**	**.12**	**.07**	**.13**	**.17**
Desire for sexual activity	0–65	17.60	15.57	12.26	12.88	−.05	−**.06**	.01	−.02	−**.06**	−.04	.01	−.03	−.03	.01	−.01
Desire for physical affection	0–65	9.95	14.51	10.65	14.95	−**.11**	−**.07**	−.04	−**.08**	−**.10**	−**.09**	−.02	−.02	−.02	−.04	−.03

Note. All correlations above an absolute value of .059 in this table were statistically significant at $p < .001$, and have been bolded to facilitate interpretation. In the upper half of the table, correlations within men are presented above the diagonal and correlations within women are presented below the diagonal. In the lower half of the table, the correlations presented were calculated in all subjects. MoSBI = Meanings of Sexual Behavior Inventory.

As seen in the top portion of Table 4, consistent with the higher-order structure supported by our EFA and CFA analyses, the positive MoSBI subscales showed fairly strong correlations with one another (sharing from 18 to 55% of their variance with one another), the negative MoSBI subscales showed fairly strong correlations with one another (sharing from 14 to 69% of their variance), and the two sets of subscales demonstrated only low to moderate amounts of correlation with each other. Although the intercorrelations among the MoSBI scales suggest that they are related to one another, they are still sufficiently moderate in size to suggest that each of the MoSBI subscales could contribute unique information to models of relationship functioning. As seen in the bottom portion of Table 4, the MoSBI subscales demonstrated only moderate associations with the conceptual boundary constructs being examined. This continued to support the discriminant validity of the MoSBI subscale scores, suggesting that they represent distinct scales from that set of existing measures and could, therefore, offer novel insights into models of sexual and relationship functioning.

It is also worth noting that each of the MoSBI subscales demonstrated a distinct pattern of correlations with these conceptual boundary scales. For example, the positive subscales of the MoSBI demonstrated more robust associations with current relationship satisfaction, sexual satisfaction, levels of physical affection, physical attraction to one's partner, emotional support and one's current sex drive. These results suggest that positive meanings of sexual behavior tend to be associated with healthier romantic and sexual relationships. In contrast, the negative subscales of MoSBI were more robustly associated with sexual dissatisfaction, engaging in negative and attacking conflict behaviors (e.g., shouting, calling each other names, and using profanity), and greater experience with and interest in casual sex. Taken as a set, the distinct patterns of correlation observed for each of the MoSBI subscales suggests that those scales are likely to yield meaningfully distinct patterns of results in multivariate models of relationship functioning. The correlations presented also serve to ground the MoSBI scales in the current literature by linking these new scales to existing measures.

Evaluating unique predictive validity of MoSBI scale scores. Taking advantage of the follow-up data provided by 862 respondents, we ran analyses predicting residual change in relationship satisfaction over 2 months, allowing the results to vary freely across genders. As seen in the top portion of Table 5, baseline relationship satisfaction and frequency of sexual activities accounted for 51 and 68% of the change in women's and men's relationship satisfaction, respectively, accounting for a large portion of the predictive variance which is not surprising over such a short follow-up interval. When added to the model in a second step, the individual MoSBI subscales made small but meaningful contributions to that prediction, accounting for an additional 3.4 and 6.1% of change in women's and men's

Table 5

Regressions Predicting Residual Change in Relationship Satisfaction Over 2 Months

Model Step Predictors	In women (n = 610)					In men (n = 252)				
	B	β	t	p	ΔR^2	B	β	t	p	ΔR^2
Model 1: MoSBI subscales										
Step 1: Controls					**.51**					**.68**
Average 2 month relationship satisfaction (intercept)	**62.20**	—	**118.43**	**.001**		**60.82**	—	**81.50**	**.001**	
t0 Relationship satisfaction	**.78**	**.71**	**21.79**	**.001**		**.94**	**.78**	**18.21**	**.001**	
t0 Frequency of sexual behavior	.01	.01	.21	.831		**.15**	**.12**	**2.81**	**.006**	
Step 2: MoSBI predictors					**.03**					**.06**
Average 2 month relationship satisfaction (intercept)	**62.19**	—	**119.94**	**.001**		**60.28**	—	**84.72**	**.001**	
t0 Relationship satisfaction	**.71**	**.65**	**17.56**	**.001**		**.91**	**.76**	**16.96**	**.001**	
t0 Frequency of sexual behavior	−.01	−.01	−.30	.761		**.13**	**.10**	**2.35**	**.020**	
MoSBI - To share pleasure	**.80**	**.21**	**4.20**	**.001**		**.74**	**.18**	**2.89**	**.004**	
MoSBI - To bond with partner	−.10	−.04	−.64	.525		**−.65**	**−.22**	**−3.16**	**.002**	
MoSBI - To de-stress	−.06	−.02	−.55	.586		**.52**	**.18**	**3.35**	**.001**	
MoSBI - To energize the relationship	−.06	−.02	−.42	.676		−.16	−.06	−.83	.407	
MoSBI - To learn more about each other	−.07	−.03	−.65	.517		.23	.09	1.49	.138	
MoSBI - To manage conflict	−.15	−.05	−1.32	.188		−.25	−.09	−1.66	.099	
MoSBI - As an incentive	−.20	−.04	−.82	.410		.12	.03	.37	.709	
MoSBI - To express anger	−.41	−.09	−1.65	.100		**−.71**	**−.17**	**−2.29**	**.023**	
MoSBI - To assert control	**.70**	**.12**	**2.29**	**.022**		.54	.12	1.72	.087	
Model 2: MoSBI composite scales										
Step 1: Controls					**.51**					**.68**
Average 2 month relationship satisfaction (intercept)	**62.20**	—	**118.55**	**.001**		**60.82**	—	**81.71**	**.001**	
t0 Relationship satisfaction	**.78**	**.71**	**21.82**	**.001**		**.94**	**.78**	**18.26**	**.001**	
t0 Frequency of sexual behavior	.01	.01	.21	.830		**.15**	**.12**	**2.81**	**.005**	
Step 2: MoSBI predictors					**.01**					.01
Average 2 month relationship satisfaction (intercept)	**62.07**	—	**119.37**	**.001**		**60.96**	—	**82.18**	**.001**	
t0 Relationship satisfaction	**.72**	**.66**	**18.36**	**.001**		**.88**	**.74**	**15.79**	**.001**	
t0 Frequency of sexual behavior	.01	.01	.22	.825		**.14**	**.11**	**2.49**	**.014**	
t0 MoSBI positive meanings	**.05**	**.08**	**2.18**	**.030**		**.08**	**.10**	**2.19**	**.029**	
t0 MoSBI negative meanings	**−.15**	**−.11**	**−3.38**	**.001**		−.07	−.06	−1.39	.165	

Note. Significant coefficients have been bolded to ease interpretation. MoSBI = Meanings of Sexual Behavior Inventory. t0 = Baseline assessment.

relationship satisfaction over 2 months, respectively (F_{women} (2,479) = 3.96, $p < .001$; F_{men}(2,182) = 4.69, $p < .001$). More specifically, engaging in sexual behavior to share pleasure with a partner predicted residual increases in relationship satisfaction over 2 months in both men and women. These effects were modest in magnitude as the standardized regression coefficients (βs) suggested that a one standard deviation difference on reports of using sex to share pleasure at baseline predicted residual increases of .21 and .18 *SD*s on relationship satisfaction at 2 months in women and men, respectively. After controlling for that, engaging in sexual behavior to de-stress also predicted comparably modest increases in relationship satisfaction for men (β = .18), suggesting that this meaning was also beneficial to relationships. Unexpectedly, the part of engaging in sexual behavior to bond with a partner that was distinct from the other positive meanings (e.g., de-stressing and sharing pleasure) predicted modest drops in satisfaction for men (β = −.22). This may suggest that if wanting to bond through sexual behavior is not also associated with wanting to share pleasure, it might represent more of an insecure attempt to connect with a partner.

Regarding the negative meanings, engaging in sexual behavior to express anger predicted modest reductions in satisfaction in men (β = −.17). Unexpectedly, the portion of engaging in sexual behavior to assert control in a relationship that was distinct from the other negative meanings predicted slight in-

creases in relationship satisfaction in women (β = .12). This may suggest that using sexual behavior to assert control in a nonangry, nonconflict avoidant manner might actually be adaptive, at least to women's own relationship satisfaction. Taken as a set, the results from the first model suggest that the individual MoSBI subscales could offer useful and distinct information to researchers for understanding changes in relationship quality across time.

As seen in the lower portion of Table 5, in comparable models, the MoSBI positive and negative composite scales accounted for an additional 1.3% of variance in women, $F(2, 487) = 6.67$, $p < .001$ and for 0.9% of variance in men, $F(2, 190) = 2.78$, $p < .065$ beyond the prediction achieved by baseline satisfaction and sexual activity. More specifically, the MoSBI positive composite predicted slight increases in relationship satisfaction in both women (β = .08) and men (β = .10), and the MoSBI negative composite predicted residual reductions in satisfaction over 2 months in women (β = −.11). Thus, even over a fairly short 2-month timeframe (in which baseline satisfaction predicts large amounts of variance across time), the MoSBI scales contributed small but meaningful amounts of prediction to the models. It is possible that the MoSBI scales might offer researchers even greater amounts of prediction over longer intervals. Taken as a set, these results suggest that the MoSBI scales are tapping novel relationship processes associated with relationship quality over time.

Discussion

Extending Previous Work—Broadening the Focus

The current study sought to take a novel perspective in developing a multidimensional measure of the meanings of sexual behavior in relationships by (a) informing the process with symbolic interactionism as a theoretical framework, and (b) building the measure from the ground up, focusing exclusively on the meanings of sexual behavior within committed romantic relationships. This builds upon an existing literature primarily focused on motives for casual sex encounters (e.g., Aspden et al., 2010; Chapleau & Oswald, 2010; Eastwick & Finkel, 2012; Gebhardt et al., 2003; Hill, 1997; Meston et al., 2009; Stephenson et al., 2011). Although that literature has developed a number of well-validated multidimensional scales (the SMS, Cooper et al., 1998; the AMORE, Hill & Preston, 1996; & the YSEX?, Meston & Buss, 2007), the focus on a casual sex context has led to scales with dimensions unlikely to be as relevant in committed romantic relationships (e.g., having sex to conform to peer pressure, to enhance social status, to achieve greater sexual experience). Consistent with our hypotheses, by starting with a respondent-generated item pool within a sample of individuals currently in romantic relationships, our EFA and CFA analyses identified three dimensions of meaning for sexual behavior in relationships that were missing from previous measures: sex as a method of energizing one's relationship, learning more about one another, and managing/avoiding conflict.

Representing Short and Long-term Relationships

In support of the novel relationship perspective, the current study also recruited a large-scale online sample of individuals representing a diverse range of relationship lengths. Thus, in comparison to the 12–36 month relationships represented in the previous literature (e.g., Impett et al., 2005, 2008a, 2008b; Sanchez et al., 2011), the relationships in the current study ranged from 0 to 636 months (53 years), with an average of 4.4 years ($SD = 6.2$). In fact, the sample contained 1,153 individuals in relationships over 36 months in length and 340 individuals in relationships over 10 years ($M = 18.5$, $SD = 7.9$), helping to ensure that the MoSBI would function as well in long-term relationships as it does in short-term dating relationships.

Robust Validity

The current study made use of a combination of classic measure development approaches (i.e., subjecting a large item pool to EFA and CFA analyses, exploring associations with conceptually distinct anchor scales from the nomological net) in combination with a less commonly used technique (IRT analyses). This measure development approach created a measure that not only (a) assesses nine key dimensions of meaning for sexual behavior within relationships, and (b) offers a stable correlational structure, but (c) also allows researchers to assess those dimensions with a minimal number of items (typically 4–5 per subscale), while (d) maximizing the precision/information (i.e., the ability to discriminate among respondents) provided by each subscale, and (e) ensuring that those subscales will continue to function well across a broad range of future samples (e.g., Table 3). The subscale scores of the MoSBI also demonstrated high levels of discriminant validity from the conceptual boundary constructs examined, suggesting that they are offering novel insights into relationship functioning.

Advantages of the MoSBI

Short, optimized scales. We chose to create 4 to 5 item subscales for the MoSBI in an effort to offer researchers maximal amounts of variance and precision for seeing meaningful differences among subjects. Although it would have been possible to identify single items to represent each dimension of meaning, we were concerned that would have markedly reduced the precision and variance of these subscales (converting a scale with 20–25 possible values down to just 6 values). As both motivation theory and symbolic interactionism could conceptualize these dimensions as mediators and moderators in models of sexual functioning, we believed that it was critical to offer future researchers scales that offered far more variance than that afforded by a single item. At the same time, we were mindful of the practical constraints on subjects' time faced by all researchers. As a result, we obtained a sufficiently large sample to allow us to use IRT to optimize these short scales, ensuring that researchers would get maximum information for each item used.

Focus versus breadth. We chose to create a multidimensional scale assessing a series of discrete dimensions with fairly focused and homogenous scales. We did this specifically to offer researchers a method of disentangling different yet related meanings of/motives for sex, thereby allowing researchers to conduct fine-grained analyses of how those various meanings might impact sexual and relationship functioning. Consistent with this approach, our correlational analyses revealed that the MoSBI subscales tended to show moderate levels of overlap with one another, suggesting that they would often yield meaningfully distinct patterns of results if treated as separate constructs in models. However, our EFA and CFA analyses also suggested that the 5 positive and 4 negative subscales could be combined into global positive and negative composites. This would be appropriate when a set of subscales yielded converging results or when a researcher desired to work with a broader conceptual definition of meanings of sex within the context of their study.

Nuanced insights. We would suggest that the MoSBI offers researchers the most precise assessment of the meanings of sexual behavior in relationships when the individual subscales are treated as separate constructs. Although the EFA, CFA, and validity analyses support the use of global positive and negative composites, the various MoSBI subscales displayed distinct patterns of discriminant correlations, suggesting that they could likely offer unique predictive variance in models of relationship functioning. In fact, some unexpected correlations emerged for specific subscales. For example, although the MoSBI manage conflict subscale correlates with the other negative subscales (rs from .45 to .52), it also shows positive correlations with the positive subscales of de-stress ($r = .45$), to energize ($r = .31$), and to learn about each other ($r = .26$). These results may suggest that although using sex to manage conflict is often associated with other negative meanings, that meaning can also be associated with a more positive approach to sex. Thus, managing conflict with sex might represent more of a mixture of adaptive and maladaptive motives, and its

effects on relationships might, therefore, be more context dependent.

Similarly, although using sex to de-stress correlates with the other positive MoSBI subscales, it shows notably weaker positive correlations with the conceptual boundary scales representing positive relationship processes than the other positive MoSBI subscales. The de-stress MoSBI subscale also shows weak positive correlations with negative conflict and sociosexual orientation, in contrast to the other positive subscales which demonstrated weak negative correlations with those constructs. This may suggest that although it is often correlated with other positive meanings, using sex to de-stress could also represent a distinct response to relationship conflict and sociosexual orientation. Taken as a set, these findings highlight that the individual MoSBI subscales are likely to yield unique predictive contributions to models when treated as separate constructs.

Unique Predictive Validity

The results presented also highlighted the potential utility of the MoSBI scales by demonstrating that, even after controlling for baseline relationship satisfaction and frequency of sexual behavior, the dimensions of the MoSBI significantly predicted change in relationship satisfaction over 2 months. Those prediction analyses suggested that the MoSBI scales helped to account for very modest amounts of variance over the controls (0.9 to 6.1%). However, we would assert that likely represents an underestimation of their true predictive utility. We would expect that a fairly stable construct like relationship quality would yield high levels of stability over such a short timeframe, leaving only small amounts of residual change to be predicted. The high percentages of variance accounted for by the controls in those models suggested that was indeed the case in our analyses. Thus, even small amounts of additional prediction above and beyond those controls are promising and suggest that the MoSBI could offer greater predictive variance in future studies modeling change over longer intervals.

The results presented in Table 5 are similar to diary studies that found daily positive meanings of sexual behavior (termed approach motives in those articles) predicted higher daily sexual desire and relationship satisfaction whereas negative meanings of sexual behavior (termed avoidance motives) predicted lower daily relationship qualities (Impett et al., 2005, 2008a, 2008b). The 2-month predictive results also extend work by Impett and colleagues (2005) that found a heterogeneous mix of negative meanings of sexual behavior (termed avoidance motives) predicted residual reductions in relationship satisfaction over 1 month and increased risk of breakup over that same time period (in a sample of 105 college students providing follow-up data). Thus, the results of the current study extend these findings in a larger and more varied sample of respondents, helping to highlight how individual dimensions of meaning can offer researchers meaningful insights into relationship functioning over time.

Sexual Behavior Can Both Harm and Help Relationships

The longitudinal results of the current study provide support for motivation theories and symbolic interactionism by highlighting that a number of dimensions of meaning were uniquely predictive of changes in relationship quality, even after controlling for frequency of sexual behavior. Thus, the results suggest that individuals vary in the meanings that they ascribe to sexual behavior within romantic relationships. Although endorsement rates were lower for the negative meanings of sexual behavior, these negative meanings are still fairly common, and it is clear that individuals do attach them to sexual behavior. More important, assessing positive and negative dimensions of meanings/motives with the MoSBI can contribute novel and meaningful information to models of relationship functioning.

Limitations and Future Directions

Despite the potential contributions of the MoSBI to couples research, the results of the current study were limited by a number of factors. First, this was a primarily White sample. This was somewhat ameliorated by the sheer size of the sample as it still included 751 nonwhite participants. It was also partially ameliorated by the finding that the MoSBI subscales seemed to continue to function well in various demographic subsamples. Despite that, future studies should seek more diverse samples to ensure that the findings presented here will continue to generalize. Second, the study was conducted entirely online. As this requires Internet access, that might have biased the sample toward higher levels of education and income. Future work should seek to validate the MoSBI with methods that reach a broader cross-section of society (e.g., national samples from random digit dialing). Third, the study used only self-report data. Diversifying this methodology in future work might yield stronger results. For example, it could be possible to have couples engage in laboratory interactions in which they discuss the meanings of sexual behavior in their relationship. Such interactions could then be objectively coded to help validate the data obtained by the MoSBI. Fourth, the study included only one partner from each relationship. The various meanings of sex might show their strongest effects *across* partners. For example, individuals using sexual behavior to control their partners might show a stronger damaging effect on their partners' satisfaction across time than it does on their own satisfaction. Alternately, using sexual behavior to control a partner could have opposite effects on satisfaction, with the individual using sex to control experiencing increases in satisfaction and the recipient experiencing decreases in satisfaction. Thus, future work should examine these hypotheses in dyadic samples that would allow such effects to be modeled. Fifth, the current study focused on individuals reporting on the intent or meaning of their own sexual behavior. It might also be productive for future work to examine how an individual perceives the intended meaning of sexual behavior for their partner. As an individual's intent might often not match a partner's perception of that intent, it could be the perception of a partner's intent or even the difference between actual and perceived intent that provide the most critical information for understanding relationship functioning. Finally, the current study used a simple two-wave design. Although this represented a significant contribution to a largely cross-sectional literature, future work should examine these hypotheses with multiwave longitudinal designs. This would allow more fine grained longitudinal analyses (e.g., modeling shifts in meanings of sexual behavior over time as time varying covariates or examining reciprocal lagged analyses to help establish directions of causality).

Conclusion

Despite these limitations, the current study provided compelling evidence to support the MoSBI as a measure of the ways people ascribe meaning to sexual behavior within relationships. By linking those meanings to change in relationships over time, our results further suggested that examining these distinct roles of sexual behavior could offer unique insights into relationship functioning. Thus, the MoSBI offers couples researchers a tool to comprehensively incorporate the meanings of sexual behavior into their studies of romantic relationships

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