

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/304362633>

# Changes in the Sexual Self-Schema of Women With a History of Childhood Sexual Abuse Following Expressive Writing Treatment

Article in *Psychological Trauma Theory Research Practice and Policy* · June 2016

DOI: 10.1037/tra0000163

---

CITATIONS

0

READS

45

4 authors, including:



[Ryan L. Boyd](#)

University of Texas at Austin

25 PUBLICATIONS 59 CITATIONS

[SEE PROFILE](#)



[Amelia M. Stanton](#)

University of Texas at Austin

12 PUBLICATIONS 4 CITATIONS

[SEE PROFILE](#)



[Cindy Meston](#)

Professor University of Texas at Austin

195 PUBLICATIONS 9,217 CITATIONS

[SEE PROFILE](#)

# Changes in the Sexual Self-Schema of Women With a History of Childhood Sexual Abuse Following Expressive Writing Treatment

Carey S. Pulverman, Ryan L. Boyd, Amelia M. Stanton, and Cindy M. Meston  
University of Texas at Austin

**Objective:** Sexual self-schemas are cognitive generalizations about the sexual self that influence the processing of sexually pertinent information and guide sexual behavior. Until recently sexual self-schemas were exclusively assessed with self-report instruments. Recent research using the meaning extraction method, an inductive method of topic modeling, identified 7 unique themes of sexual self-schemas: family and development, virginity, abuse, relationship, sexual activity, attraction, and existentialism from essays of 239 women (Stanton, Boyd, Pulverman, & Meston, 2015). In the current study, these themes were used to examine changes in theme prominence after an expressive writing treatment. **Method:** Women ( $n = 138$ ) with a history of childhood sexual abuse completed a 5-session expressive writing treatment, and essays on sexual self-schemas written at pretreatment and posttreatment were examined for changes in themes. **Results:** Women showed a reduction in the prominence of the abuse, family and development, virginity, and attraction themes, and an increase in the existentialism theme. **Conclusions:** This study supports the validity of the 7 themes identified by Stanton and colleagues (2015) and suggests that expressive writing may aid women with a history of sexual abuse to process their abuse history such that it becomes a less salient aspect of their sexual self-schemas.

**Keywords:** sexuality, sexual health, sexual abuse, language analysis, topic modeling

Self-schemas are cognitive generalizations about the self that affect people's perceptions and behavior (Markus, 1977). Schemas act as heuristics about the self that can lead to negative consequences as information is selectively processed and evaluated according to these overarching beliefs. For example, a person who holds a self-schema that he or she is "damaged" will interpret situations that arise in his or her life, such as being bullied or getting divorced, as additional evidence for these negative beliefs, and the beliefs will become more entrenched. Self-schemas arise from social experiences during infancy and childhood (Bowlby, 1969, 1988; Mikulincer, 1995), and tend to be stable over time (Mikulincer, 1995). Self-schemas have been shown to play a role in the development of a number of psychological disorders including depression (Dozois & Beck, 2008), social anxiety (Alden, Auyeung, & Plasencia, 2014), and eating disorders (Stein & Corte, 2008). Empirically supported treatments for these disorders often focus on altering maladaptive self-schemas through therapeutic exercises (Beck, 2011).

Sexual self-schemas represent cognitive generalizations about the sexual self and influence beliefs about sexuality and sexual behavior (Andersen & Cyranowski, 1994). Sexual self-schemas have been associated with sexual function in women: women with greater positive sexual self-schemas report higher sexual function than women with lower positive sexual self-schemas (Andersen, Woods, & Copeland, 1997; Rellini, Ing, & Meston, 2011). Historically, sexual self-schemas have been assessed with a self-report instrument composed of a trait-adjective rating scale that provides scores for two independent positive themes: passion/romance and openness to sexual experience, and one independent negative theme: embarrassment/conservatism (Andersen & Cyranowski, 1994).

The meaning extraction method (MEM), a topic modeling method for natural language analysis, was recently used to extract sexual self-schema themes from women's open-ended expressive writing essays on their sexuality (Stanton et al., 2015). This process generated seven unique themes—family and development, virginity, abuse, relationship, sexual activity, attraction, and existentialism—in contrast to the three themes measured by the sexual self-schema self-report instrument (Andersen & Cyranowski, 1994). The family and development theme focused on family members ("mother, father, sister, brother"), childhood associations, ("pretend, kid"), and puberty/coming of age ("pretty, breast, eventually"). The virginity theme was related to dating and the loss of virginity in high school and college. The abuse theme focused on types of sexual abuse ("rape, abuse, molest"), negative emotions ("ashamed, disgust, hate"), and negative judgments ("horrible, bad, wrong"). In contrast, the relationship theme was concerned with intimacy and connection in romantic relationships. The sexual activity theme focused on sexual body parts ("penis, hand") and sexual behaviors, ("kiss, intercourse, oral"). The theme

---

Carey S. Pulverman, Ryan L. Boyd, Amelia M. Stanton, and Cindy M. Meston, Department of Psychology, University of Texas at Austin.

This research was supported by Grant R01 HD51676 from the National Institute for Child Health and Human Development to Cindy M. Meston. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the National Institute for Child Health and Human Development. This research was also partially supported by the National Science Foundation (Grant IIS-1344257).

Correspondence concerning this article should be addressed to Cindy M. Meston, Department of Psychology, University of Texas at Austin, 108 East Dean Keaton Street, Stop A8000, Austin, TX 78712. E-mail: meston@psy.utexas.edu

of attraction was focused on compelling qualities (“power, attractive”) and a sense of openness to sexual experiences (“arouse, fantasy, ready”). The existentialism theme focused on emotional reflection and meaning making processes, with indicators like “understand” and “grow.” Unlike traditional self-report instruments, the MEM approach generates themes from participants’ natural language using an inductive approach that removes many problematic constraints and blind spots imposed by the researcher from the assessment procedures. Relative to a standard questionnaire, participants can describe their self-schemas more comprehensively in their own words, thereby reflecting their own preexisting concept relations, and can complete a basic writing task in approximately the same time as a battery of self-report questionnaires. The MEM methodology facilitates participant-generated content, rather than researcher preconceptions, to guide the study of complex phenomena such as self-schemas. The noninvasive nature of the MEM makes it particularly useful for exploring sensitive topics like sexuality.

Research by Stanton and colleagues was the first to apply the MEM to essays on sexual self-schemas (2015). The MEM has previously been used to examine diverse constructs such as personality (Chung & Pennebaker, 2008), aftercare treatment (Wolf, Chung, & Kordy, 2010), cultural differences (Ramírez-Esparza, Chung, Sierra-Otero, & Pennebaker, 2012), attitudes toward alcohol (Lowe et al., 2013), and personal values (Boyd et al., 2015). In addition to the identification of seven unique themes of women’s sexual self-schemas, Stanton et al. (2015) reported differences in the prominence of themes by demographic characteristics. Importantly, women with a history of childhood sexual abuse (CSA) wrote about the abuse and attraction themes more than their nonabused counterparts. In contrast, nonabused women wrote about the virginity and relationship themes more than the abused women.

The differences in MEM theme prominence between abused and nonabused women are supported by previous research using self-report measures of sexual self-schemas that have also identified differences between these groups. In studies using self-report instruments, women with a history of CSA report lower positive, but not greater negative, sexual self-schemas than nonabused women (Meston, Rellini, & Heiman, 2006; Reissing, Binik, Khalifé, Cohen, & Amsel, 2003). Differences between the sexual self-schemas of these groups may be important for describing the sexuality of abused women, who are at a higher risk of developing sexual dysfunction than their nonabused peers (Leonard & Follette, 2002; Loeb et al., 2002). In the general population of women, 43% report sexual problems (Laumann, Paik, & Rosen, 1999; Shifren, Monz, Russo, Segreti, & Johannes, 2008), yet in abused samples 65–85% of women report sexual difficulties (Sarwer & Durlak, 1996; Westerlund, 1992). Abused women also show a unique presentation of sexual difficulties with a higher prevalence of arousal dysfunction than other disorders (Leonard & Follette, 2002; van Berlo & Ensink, 2000), yet in the general population of women, low desire is the most common sexual complaint (Laumann et al., 1999; Shifren et al., 2008). Abused women are also less responsive to standardized sex therapy treatments than nonabused women (Berman, Berman, Bruck, Pawar, & Goldstein, 2001; Maltz, 2002, 2012), suggesting that there may be something unique about the sexual difficulties of abused women.

The differences in sexual self-schemas, presentation of sexual dysfunction, and response to standardized sex therapy between abused and nonabused women suggests that abused women may require specialized sex therapy approaches. Posttrauma expressive writing has been shown to improve mental and physical health in a variety of clinical and nonclinical samples (Frattaroli, 2006). Although the exact mechanisms linking expressive writing and health benefits remain under investigation (Pennebaker, 2004), the writing process is believed to aid in the cognitive processing of past experiences and the integration of these experiences into self-schemas (Pennebaker & Chung, 2011). Meston and colleagues proposed that expressive writing treatment might be a particularly appropriate form of treatment for women with a history of abuse, as women can control the pace and intensity of the treatment sessions (Meston, Lorenz, & Stephenson, 2013). Sexual abuse has been described as a crime about power and control over the child victim (Hall, 2008; Scheff & Retzinger, 2003), therefore any methods for restoring control to the patient during treatment may accelerate the healing process (Maltz, 2002, 2012). In their randomized clinical trial of a five-session expressive writing treatment for sexual difficulties in women with a history of CSA, Meston and colleagues found that participants’ sexual function improved and symptoms of depression and posttraumatic stress disorder (PTSD) decreased (Meston, Lorenz, & Stephenson, 2013). Given that prior research on expressive writing suggests that writing may alter maladaptive self-schemas (Pennebaker & Chung, 2011), we applied the MEM procedure to the essays written by abused women before and after this expressive writing treatment to determine whether treatment led to changes in women’s sexual self-schema themes. This method allows us to determine whether abused women’s schemas become more similar to the thematic patterns of nonabused women’s schemas (identified by Stanton et al., 2015) following treatment. A greater understanding of the experience of sexual dysfunction for abused women, particularly the ways in which their problems are distinct from the sexual problems of nonabused women, could contribute to the development of specialized treatments for this vulnerable population.

Based on the assumption that as abused women heal, their sexual self-schema theme use will more closely resemble that of nonabused women, we hypothesized that abused women would show increases in the prominence of the virginity and relationship themes and decreases in the prominence of the abuse and attraction themes in their essays, thus making their themes more similar to those reported by nonabused women. We did not anticipate changes in the other theme categories: family and development, sexual activity, attraction, and existentialism. Results may provide insight into the cognitive processing that occurs during expressive writing treatment for women with a history of CSA.

## Method

### Participants

Participants were recruited from the local community with online and print advertisements. Recruitment materials described a treatment study for women experiencing sexual difficulties with a past history of CSA. Interested women called the laboratory to complete a phone screen to determine eligibility. The eligibility

criteria included at least 18 years of age, a history of CSA prior to age 16, currently sexually active or in a potentially sexual relationship with a partner, and currently experiencing sexual dysfunction, sexual distress, or low sexual satisfaction. For the purposes of this study, CSA was defined as forced or unwanted oral, anal, or vaginal penetration, or genital touching or fondling before age 16 and at least 2 years prior to study enrollment. Women were excluded from the study if they reported experiencing sexual abuse in the previous 2 years, a traumatic event in the previous 3 months, being involved in an abusive relationship, a diagnosis of bipolar disorder or schizophrenia in the past 6 months, suicidal or homicidal ideation, recent illicit drug use, or currently receiving psychological treatment for abuse or sexuality-related concerns. Further details on the recruitment and screening of participants can be found in Meston et al., 2013. Eligible women were invited to schedule an intake session to participate in the study.

The final sample included 138 women ages 19 to 63 ( $M = 34.10$ ,  $SD = 10.49$ ). The majority of the sample identified as heterosexual (82%), 7% identified as bisexual, 7% identified as lesbian, and 4% did not report their sexual orientation. In this sample 56% of the women were Caucasian, 14% were Hispanic/Latina, 10% were African American/Black, 2% were Asian, 0.7% were Native American, 11% were biracial or multiracial, and 7% did not report their racial identity. The majority of the sample had completed at least some college (82%). The sample included more women who were married or in a committed relationship (67%), than single women (27%), and 6% of women did not report their relationship status. The majority of the sample reported CSA that included penetration (81%); the rest of the sample reported genital touching or fondling only (19%). Age of first CSA experience ranged from 1 to 15 with an average of 8.86 years ( $SD = 4.60$ ).

## Materials

**Assessment writing prompt.** In each assessment session women completed a 30-min writing task individually on a computer in a private testing room. The writing prompt read:

For the next 30 min, I would like you to write about your personal thoughts and feelings associated with sex and sexuality. In your writing, I'd like you to link your thoughts about sex to past, current, or future sexual experiences or relationships. You might also address more broadly how you view yourself as a sexual person. Please try to be as detailed as possible in your description. I'd like you to really let go and explore your very deepest emotions and thoughts.

**Measures.** Women completed a demographics questionnaire. Women also completed a number of self-report measures on sexual and mental health including sexual function, depressive symptoms, and PTSD symptoms, that have been presented elsewhere (e.g., Meston et al., 2013) but were not relevant to the current analyses.

## Procedure

Study sessions were completed in a sexuality laboratory at a large university and led by female research administrators who were doctoral students with master's degrees in psychology.

**Assessment sessions.** Eligible participants completed five identical 2-hr assessment sessions at pretreatment, posttreatment,

2-week follow-up, 1-month follow-up, and 6-month follow-up. In the first assessment session (i.e., pretreatment session) women were oriented to study procedures and completed informed consent. In each of the five assessment sessions women were asked to write for 30-min on a sexual essay prompt (described above). The same sexual essay writing prompt was used in each session to evaluate changes in the essays over time. Only the assessment session sexual essays were analyzed for the current study. In each assessment session women also completed self-report and interview measures of mental and sexual health. Participants were compensated monetarily for their time. A total of 407 assessment session sexual essays were completed by participants and analyzed in the current study. Similar to other longitudinal treatment studies, a number of participants showed attrition between assessments. Nevertheless, participants in the current sample completed an average of 2.95 sessions out of five possible sessions. Participants had to attend a minimum of two sessions (the intake session and at least one other session) to be included in the current analyses. Eighty-six participants met this requirement out of the full sample of 138 women.

**Treatment sessions.** After the pretreatment assessment women were randomly assigned to one of three expressive writing treatment groups. Treatment included five 30-min sessions completed weekly or bimonthly. In each treatment session the participant completed the writing task on a desktop computer in a private room. The treatment session writing prompts were not identical each session. Treatment essays were not analyzed for the current study, as the variability in the prompts precluded a controlled examination of changes in theme use. A more comprehensive explanation of the treatment is detailed elsewhere (Meston et al., 2013), and the full text of all study prompts can be viewed online (<http://bit.ly/wKzXT8>).<sup>1</sup>

## Language Analysis

Past research applying the MEM to essays on sexual self-schemas identified seven unique themes including family and development, virginity, abuse, relationship, sexual activity, attraction, and existentialism—the words included in each theme can be found in Stanton et al. (2015, see Table 5) in the order of the strength of their factor loading to that theme. For a more detailed explanation of the identification of the seven sexual self-schema themes, including details of the principal components analysis used to extract the themes, see Stanton et al. (2015). Theme use in each essay was quantified using a standard word-counting approach. This approach uses word-counting software (Boyd, 2014) to calculate the percentage of words belonging to each theme within each essay. Theme use, then, was reflected as a percentage of the total essay. These quantified theme scores were used for all subsequent analyses. Note that each theme constitutes a bipolar dimension that can theoretically range in scores from  $-100$  to  $+100$ . Theme use scores that are positive indicate greater theme prominence in the essay, and negative scores indicate less prominence in the essay.

<sup>1</sup> Given the level of attrition in later assessment sessions, the essays of women in all three treatment groups were included in the current study in order to achieve adequate statistical power for the theme use analyses.

## Analytic Plan

Data were analyzed with linear mixed effects repeated measures models to test for changes in theme use across time (i.e., across the five assessment sessions from pretreatment through six month follow-up). Mixed effects analyses allow for the modeling of individual differences in both baselines (random intercepts) and trajectories (random slopes) and are robust to missing data (i.e., data for a given participant may be present for the 1-month follow-up session but not the 6-month follow-up session, depending on attrition; Schafer & Graham, 2002). Follow-up pairwise comparisons were made with Tukey's honest significant difference (HSD) test to manage the family wise error rate for multiple comparisons.

## Results

Although we did not anticipate any changes in the family and development theme, women showed a significant decrease in their use of the family and development theme over time. Pairwise comparisons revealed a significant difference between pretreatment and posttreatment, pretreatment and two 2-week follow-up, pretreatment and 1-month follow-up, and pretreatment and 6-month follow-up (Table 1 for all statistical values). There were no significant differences between any of the other pairs of time points (Figure 1A).

According to our hypothesis that abused women's theme use would come to resemble that of nonabused women, we anticipated an increase in the use of the virginity theme. Women actually showed a significant decrease in their use of the virginity theme over time. Pairwise comparisons indicated a significant difference between pretreatment and posttreatment, pretreatment and 2-week follow-up, pretreatment and 1-month follow-up, and pretreatment and 6-month follow-up. There were no significant differences between any of the other pairs of time points (Figure 1B).

In line with our hypotheses that the abuse theme would become less salient after treatment, women showed a significant decrease in their use of the abuse theme over time. Pairwise comparisons indicated a significant difference between pretreatment and post-treatment, pretreatment and 2-week follow-up, pretreatment and 1-month follow-up, and pretreatment and 6-month follow-up.

There were no significant differences between any of the other pairs of time points (Figure 1C).

Although we had anticipated an increase in the relationship theme, the data revealed a more complex relationship. The greatest use of the relationship theme occurred at posttreatment. There was a significant increase in the use of this theme between pretreatment and posttreatment. There was a significant decrease in the use of this theme between posttreatment and 1-month follow-up, and posttreatment and 6-month follow-up (Figure 1D).

There was no change in the use of the sexual activity theme over time, as we had hypothesized. Women's use of the sexual activity theme did not change after treatment.

In support of our hypotheses, women showed a significant decrease in their use of the attraction theme over time. Pairwise comparisons revealed a significant decrease in the use of this theme between pretreatment and 6-month follow-up. There were no significant differences between any of the other pairs of time points (Figure 1E).

Women showed a marginally significant ( $p < .06$ ) increase in their use of the existentialism theme over time, in contrast to our hypothesis that use of this theme would remain stable. Pairwise comparisons indicated that there was a significant difference in the use of this theme between pretreatment and 6-month follow-up. There were no significant differences between any of the other pairs of time points (Figure 1F).

## Discussion

After an expressive writing treatment, women with a history of CSA showed changes in their use of certain sexual self-schema themes. Abused women evidenced a decrease in their use of the abuse, family and development, virginity, and attraction schemas, and an increase in their use of the existentialism schema. The prominence of the relationship schema initially increased and then decreased. There was no change in the prominence of the sexual activity schema.

In line with our hypotheses, women showed a reduction in their use of the abuse schema. As women processed their history of abuse throughout treatment they may have organized their memories and emotions about the abuse, and/or habituated to thoughts of the abuse, leading to a reduced salience of this schema when writing about their

Table 1  
Changes in Sexual Self-Schema Theme Prominence Over Time

Theme	Direction	Overall	T1 to T2	T1 to T3	T1 to T4	T1 to T5	T2 to T3	T2 to T4	T2 to T5	T3 to T4	T3 to T5	T4 to T5
		<i>F</i>	<i>z</i>									
Family and development	Decrease	10.94***	4.75***	4.50***	5.42***	4.27***	.06	.91	.07	.95	.12	.78
Virginity	Decrease	6.30***	4.30***	3.29**	3.58**	3.23*	.77	.40	.54	.35	.18	.14
Abuse	Decrease	10.39***	4.27***	4.60***	5.56***	3.69**	.46	1.45	.08	.99	.50	1.43
Relationship	Both	3.33*	2.92*	.66	.50	.57	1.96	3.00*	2.94*	1.04	1.09	.10
Sexual activity	No change	.50	1.20	.65	.41	.20	.46	.65	1.16	.20	.72	.52
Attraction	Decrease	2.65*	1.98	1.83	1.60	3.07*	.07	.23	1.23	.16	1.27	1.41
Existentialism	Increase	2.34†	.35	.31	.06	2.73*	.59	.25	2.20	.32	2.69	2.35

Note. Statistics are presented for overall differences and pairwise comparisons between sessions. T1 through T5 represent the pre-treatment (T1), post-treatment (T2), two week follow-up (T3), one month follow-up (T4), and six month follow-up (T5) sessions respectively. Degrees of freedom for the overall tests were 4, 265.

†  $p < .06$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

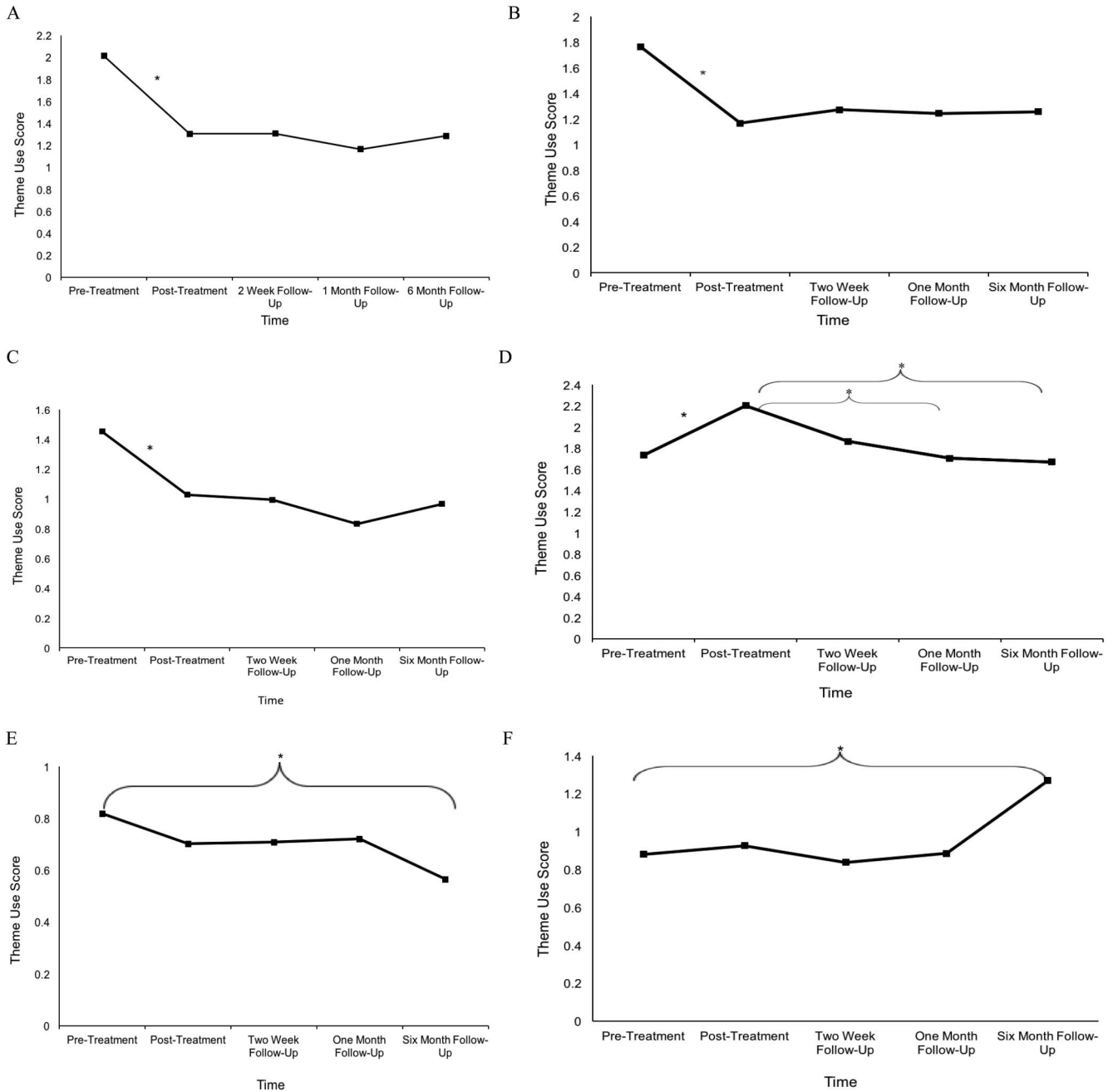


Figure 1. A: Changes in the use of the family and development theme over time. Women showed a significant decrease in their use of this theme between the pretreatment and posttreatment sessions that was maintained through the follow-up sessions. B: Changes in the use of the virginity theme over time. Women showed a significant decrease in their use of this theme between the pretreatment and posttreatment sessions that was maintained through the follow-up sessions. C: Changes in the use of the abuse theme over time. Women showed a significant decrease in their use of this theme between the pretreatment and posttreatment sessions that was maintained through the follow-up sessions. D: Changes in the use of the relationship theme over time. Women showed a significant increase in their use of this theme between the pretreatment and posttreatment sessions. Then women showed a significant decrease in the use of this theme between the posttreatment and one month follow-up sessions, and the posttreatment and six month follow-up sessions. E: Changes in the use of the attraction theme over time. Women showed a significant decrease in their use of this theme between the pretreatment and 6-month follow-up sessions. F: Changes in the use of the existentialism theme over time. Women showed a significant increase in their use of this theme between the pretreatment and 6-month follow-up sessions.

sexuality after treatment. Expressive writing has been posited to improve mental health by aiding in the processing of past traumatic events (Pennebaker & Chung, 2011). Clinical experts in the treatment of women with a history of CSA and sexual dysfunction advocate for treating trauma symptoms related to abuse prior to treating sexual difficulties (Maltz, 2002, 2012). These experts explain that sex therapy is not appropriate if the patient is still experiencing a significant level of posttraumatic stress. The expressive writing treatment may have aided women in processing their abuse history, such that by the end of treatment, the theme of abuse was a less-easily accessible component of their sexual self-schemas. In other words, writing may have helped the women to acknowledge and set aside their history of abuse, so that they could focus on the other elements of their sexual self-schemas.

The reduction in the family and development schema might be related to the reduction in the abuse schema, as 52% of the women in this study reported being abused by family members. As abuse became less salient for women, their focus on family may have also decreased. Notably, the entire reduction in women's use of these two schemas (abuse, and family and development) occurred between the pretreatment and posttreatment sessions, and that reduction was maintained over time in the follow-up assessment sessions (Figure 1A and 1C). This pattern in theme use supports the notion that the expressive writing treatment itself (i.e., the five treatment sessions) helped women to process their abuse history, as women did not show further reductions in the use of the abuse and family and development schemas in the follow-up assessment sessions. In addition to the abuse survivor, family members are also negatively affected by reports of sexual abuse in the family, therefore participants may have used the family and development theme less over time as they processed the impact of abuse on their families.

Contrary to our hypotheses, women did not show an increase in the prominence of the virginity schema. Rather, women showed a decrease in the use of this schema over time. Prior research has noted differences in the use of this theme between abused and nonabused women and suggested that the loss of virginity may be central to the psychosexual development of nonabused women, but not of abused women, for whom the abuse is likely the most salient aspect of their early psychosexual development (Stanton et al., 2015). Despite engaging in the expressive writing treatment, the schema of virginity did not gain comparable prominence in abused women's sexual self-schemas as has been found for nonabused women. Early sexual abuse may permanently affect the way women view the beginning of their sexuality. It is possible that early sexual experiences will always have a negative valence for abused women, therefore processing and letting go of past experiences in favor of focusing on the present is more adaptive for this group than trying to reframe their early sexual experiences more positively.

Consistent with our hypotheses, women showed a reduction in their use of the attraction schema from the posttreatment to the final follow-up session. As a reminder, this schema focused on compelling qualities and openness to sexual experiences. Prominence of the attraction schema was previously found to differ between women with and without a history of CSA, with abused women showing a greater prominence of this schema than nonabused women (Stanton et al., 2015). Two notable patterns of sexual behavior have been observed in women with a history of CSA: hypersexuality and hyposexuality (Rellini, 2008). Hypersexuality has been posited to be related to high impulsivity. It is possible that some of the abused women

in the current study had a history of hypersexuality, which might have been expressed through a higher use of the *attraction* schema in their pretreatment essays. As treatment helped women to process their abuse history, their tendency toward impulsivity and hypersexuality may have decreased, which was then reflected through a reduction in the attraction schema.

Previous research has shown that nonabused women write about the relationship schema, which focuses on intimacy and connection with a romantic partner, more than abused women (Stanton et al., 2015); therefore we predicted that abused women would write about this schema more over time. Consistent with our hypothesis, the relationship schema showed a significant increase in prominence between the pretreatment and posttreatment assessments (Figure 1D), yet this increase was not maintained over time in the follow-up sessions. Women showed a significant decrease in this schema from posttreatment to the follow-up sessions at 1 month and 6 months posttreatment. It is possible that the dose provided in this expressive writing treatment (i.e., five 30-min writing sessions) was not enough treatment to produce reliable changes in this schema. Difficulty in intimate relationships has been conceptualized as a consequence of the disruption of trust that occurs during CSA, especially if the perpetrator is a parent or relative (Cole & Putnam, 1992). Therefore abused women may require more treatment on intimacy issues before they are likely to show similar use of the *relationship* schema in their writing compared to nonabused women. On the other hand, it is also possible that expressive writing aids abused women more in self-focused elements of sexual self-schemas rather than relational elements of sexual self-schemas. Abused women may feel the need to further develop their independent sexual identities before thinking about their sexuality in a relational context. This difference could indicate that treatment for sexual difficulties in abused women necessitates a greater focus on the self than on the partner or relationship.

The existentialism schema, which invokes concepts associated with meaning-making and reflection ("thought, understand, question, grow"), increased in prominence after treatment. Yet, for this schema, the increase did not occur until the final follow-up session, 6 months after the end of treatment (Figure 1F). In this case, both the treatment (five treatment sessions) and assessment (five assessment sessions) writing sessions may have allowed women to engage in meaning-making and reflection on their treatment progress. Meaning making has been defined as a longer-term process than other aspects of therapy (Adler, 2012), suggesting that continuing expressive writing exercises past the initial five treatment sessions may confer additional benefit. It is also possible that women's meaning-making processes continued beyond the 6-month follow-up session but because women were not assessed after 6-months posttreatment, we were unable to examine the potential progression of this psychological process. The increase in the existentialism schema could also be related to the design of the study, as the 6-month follow-up assessment session was women's final session of an 8- to 12-month study process. Women may have waited until the final session to reflect on their entire experience in the study and therefore the increase in the existentialism schema was not observed until this session. If the study had concluded after three follow-up sessions (rather than the five sessions used in the current study), analyses may have identified a change in this schema earlier. Future research with this expressive writing treat-

ment might examine changes in the existentialism theme to help determine the most effective length of treatment.

Changes in the prominence of sexual self-schema themes in women's essays from pre- to posttreatment provides further validation of the seven themes identified with the MEM by Stanton and colleagues (2015). The seven sexual self-schema themes were consistently observed in the essays written by women at different points in time, suggesting that these themes are reliable over time. This was the first study to compare changes in the use of these themes after treatment and found that many of the themes changed in prominence after the expressive writing treatment, suggesting that the treatment affected women's sexual self-schemas. Results also indicate that although abused women may focus less on their abuse over time, other elements of their sexual self-schemas, such as the relative importance of virginity and relationships, may remain distinct from the sexual self-schemas of nonabused women even after the abused women's sexual function has improved.

Findings from the current study on the relative prominence of sexual self-schemas may aid therapists who work with this population. Results indicate that when abused women are asked to engage in expressive writing about their sexuality, they first choose to focus on the abuse and their family and development, and later on existential ideas of reflection, questioning, and growth. Therapists who serve this population may want to experiment with this progression of self-schema themes in psychotherapy treatment. To aid therapists in this process, already existing software could be used that quickly identifies these themes in text or the transcript of a therapy session so that therapists could receive a report of women's use of schemas for the current session and previous sessions to track treatment progress. It might also be possible to track schemas to determine the appropriate length of treatment. If therapists notice an avoidance of abuse and family and development schemas early in treatment, it may be sign that they are working with a patient who will require more treatment than average to address her concerns. When women begin to use words that are associated with the existentialism schema, it may be an indicator that treatment is advancing toward termination.

In addition to benefits for individual therapy, it may be possible to assess sexual self-schemas in natural language to identify women who are at-risk for psychological difficulties related to a history of CSA. Much of the research using topic modeling methods, such as the MEM, analyzes natural language text from the Internet (e.g., Boyd et al., 2015; Iliev, Dehghani, & Sagi, 2014). Given the rise in popularity of personal expression in online blogs and social media sites, many people share personal information related to psychopathology online (Prieto, Matos, Álvarez, Cacheda, & Oliveira, 2014). Online text could be analyzed for the seven sexual self-schema themes, particularly for the presence of the abuse and family and development schemas, to help identify women who are struggling with abuse-related issues. These women could be provided with information about support services for abuse survivors, including information about [Meston et al. \(2013\)](#) expressive writing treatment. Women could use the expressive writing treatment at home in an effort to process their abuse history and improve their sexual function and overall mental health.

There were a number of limitations in this study that warrant mention. Compared to other studies of natural language use ([Chung & Pennebaker, 2008](#)), the sample was relatively small.

Additionally, this study used a nonrandom sample, as all participants were seeking treatment for sexual difficulties. Therefore, these results might not generalize to the larger population of women with a history of abuse and sexual difficulties who are not seeking treatment. Because of attrition in the later follow-up sessions, we were unable to examine the potential relationship between changes in theme prominence and changes in treatment outcomes. A greater understanding of the relationship between sexual self-schemas and sexual and mental health would be helpful information for clinicians interested in assessing natural language use as a marker of treatment progress.

As previously mentioned, women with a history of CSA are at a heightened risk of developing sexual difficulties and fail to respond to existing sex-therapy treatments as well as their nonabused counterparts. To date, researchers have been unable to explain the differences between the sexual problems of these two groups of women. Methods of natural language analysis, such as the MEM, provide a promising new method of looking deeper into the minds of abused women suffering from sexual difficulties. The current study lends further support to the MEM-extracted sexual self-schemas identified previously ([Stanton et al., 2015](#)) and demonstrated meaningful changes in certain schemas after expressive writing treatment, suggesting that expressive writing treatment alters women's sexual self-schemas. Future research with larger samples of women, possibly gleaned from the Internet, are needed to further explore the validity of these themes and examine their relationship to sexual health. Additional studies may provide a more comprehensive understanding of sexual dysfunction in abused women and could aid in the development of specialized treatments for this underserved population.

## References

- Adler, J. M. (2012). Living into the story: Agency and coherence in a longitudinal study of narrative identity development and mental health over the course of psychotherapy. *Journal of Personality and Social Psychology, 102*, 367–389. <http://dx.doi.org/10.1037/a0025289>
- Alden, L. E., Auyeung, K. W., & Plascencia, L. (2014). Social anxiety and the self. In S. G. Hofmann & P. M. DiBartolo (Eds.), *Social anxiety: Clinical, developmental, and social perspectives* (3rd ed., pp. 531–549). San Diego, CA: Elsevier Academic Press.
- Andersen, B. L., & Cyranowski, J. M. (1994). Women's sexual self-schema. *Journal of Personality and Social Psychology, 67*, 1079–1100. <http://dx.doi.org/10.1037/0022-3514.67.6.1079>
- Andersen, B. L., Woods, X. A., & Copeland, L. J. (1997). Sexual self-schema and sexual morbidity among gynecologic cancer survivors. *Journal of Consulting and Clinical Psychology, 65*, 221–229. <http://dx.doi.org/10.1037/0022-006X.65.2.221>
- Beck, J. (2011). *Cognitive behavior therapy* (2nd ed.). New York, NY: Guilford Press.
- Berman, L. A., Berman, J. R., Bruck, D., Pawar, R. V., & Goldstein, I. (2001). Pharmacotherapy or psychotherapy?: Effective treatment for FSD related to unresolved childhood sexual abuse. *Journal of Sex & Marital Therapy, 27*, 421–425. <http://dx.doi.org/10.1080/713846808>
- Bowlby, J. (1969). *Attachment and loss*. New York, NY: Basic Books.
- Bowlby, J. (1988). *A secure base: Parent-child attachment and healthy human development*. New York, NY: Basic Books.
- Boyd, R. L. (2014). *MEH: Meaning extraction helper* (Version 1.2.42). Austin, TX: Ryan L. Boyd.
- Boyd, R. L., Wilson, S. R., Pennebaker, J. W., Kosinski, M., Stillwell, D. J., & Mihalcea, R. (2015). *Values in words: Using language to evaluate and understand personal values*. In *Proceedings of the Ninth*



- International AAAI Conference on Web and Social Media*, 31–40. Oxford, UK: AAAI Conference.
- Chung, C. K., & Pennebaker, J. W. (2008). Revealing dimensions of thinking in open-ended self-descriptions: An automated meaning extraction method for natural language. *Journal of Research in Personality*, 42, 96–132. <http://dx.doi.org/10.1016/j.jrp.2007.04.006>
- Cole, P. M., & Putnam, F. W. (1992). Effect of incest on self and social functioning: A developmental psychopathology perspective. *Journal of Consulting and Clinical Psychology*, 60, 174–184. <http://dx.doi.org/10.1037/0022-006X.60.2.174>
- Dozois, D. J. A., & Beck, A. T. (2008). Cognitive schemas, beliefs and assumptions. In K. S. Dobson & D. J. A. Dozois (Eds.), *Risk factors in depression* (pp. 121–143). San Diego, CA: Elsevier Academic Press. <http://dx.doi.org/10.1016/B978-0-08-045078-0.00006-X>
- Frattaroli, J. (2006). Experimental disclosure and its moderators: A meta-analysis. *Psychological Bulletin*, 132, 823–865. <http://dx.doi.org/10.1037/0033-2909.132.6.823>
- Hall, K. (2008). Childhood sexual abuse and adult sexual problems: A new view of assessment and treatment. *Feminism & Psychology*, 18, 546–556. <http://dx.doi.org/10.1177/0959353508095536>
- Iliev, R., Dehghani, M., & Sagi, E. (2014). Automated text analysis in psychology: Methods, applications, and future developments. *Language and Cognition*, 7, 1–26. <http://dx.doi.org/10.1017/langcog.2014.30>
- Laumann, E. O., Paik, A., & Rosen, R. C. (1999). Sexual dysfunction in the United States: Prevalence and predictors. *JAMA: Journal of the American Medical Association*, 281, 537–544. <http://www.ncbi.nlm.nih.gov/pubmed/10022110>. <http://dx.doi.org/10.1001/jama.281.6.537>
- Leonard, L. M., & Follette, V. M. (2002). Sexual functioning in women reporting a history of child sexual abuse: Review of the empirical literature and clinical implications. *Annual Review of Sex Research*, 13, 346–388.
- Loeb, T. B., Williams, J. K., Carmona, J. V., Rivkin, I., Wyatt, G. E., Chin, D., & Asuan-O'Brien, A. (2002). Child sexual abuse: Associations with the sexual functioning of adolescents and adults. *Annual Review of Sex Research*, 13, 307–345. Retrieved from <http://dx.doi.org/10.1080/10532528.2002.10559808>
- Lowe, R. D., Heim, D., Chung, C. K., Duffy, J. C., Davies, J. B., & Pennebaker, J. W. (2013). In verbis, vinum? Relating themes in an open-ended writing task to alcohol behaviors. *Appetite*, 68, 8–13. <http://dx.doi.org/10.1016/j.appet.2013.04.008>
- Maltz, W. (2002). Treating the sexual intimacy concerns of sexual abuse survivors. *Sexual and Relationship Therapy*, 17, 321–327. <http://dx.doi.org/10.1080/1468199021000017173>
- Maltz, W. (2012). *The Sexual Healing Journey*. New York, NY: Harper Collins.
- Markus, H. (1977). Self-schemata and processing information about the self. *Journal of Personality and Social Psychology*, 35, 63–78. <http://dx.doi.org/10.1037/0022-3514.35.2.63>
- Meston, C. M., Lorenz, T. A., & Stephenson, K. R. (2013). Effects of expressive writing on sexual dysfunction, depression, and PTSD in women with a history of childhood sexual abuse: Results from a randomized clinical trial. *Journal of Sexual Medicine*, 10, 2177–2189. <http://dx.doi.org/10.1111/jsm.12247>
- Meston, C. M., Rellini, A. H., & Heiman, J. R. (2006). Women's history of sexual abuse, their sexuality, and sexual self-schemas. *Journal of Consulting and Clinical Psychology*, 74, 229–236. <http://dx.doi.org/10.1037/0022-006X.74.2.229>
- Mikulincer, M. (1995). Attachment style and the mental representation of the self. *Journal of Personality and Social Psychology*, 69, 1203–1215. <http://dx.doi.org/10.1037/0022-3514.69.6.1203>
- Pennebaker, J. W. (2004). Theories, therapies, and taxpayers: On the complexities of the expressive writing paradigm. *Clinical Psychology: Science and Practice*, 11, 138–142. <http://dx.doi.org/10.1093/clipsy.bph063>
- Pennebaker, J. W., & Chung, C. K. (2011). Expressive writing: Connections to mental and physical health. In H. S. Friedman (Ed.), *Oxford handbook of health psychology* (pp. 417–437). New York, NY: Oxford University Press. <http://dx.doi.org/10.1093/oxfordhb/9780195342819.013.0018>
- Prieto, V. M., Matos, S., Álvarez, M., Cacheda, F., & Oliveira, J. L. (2014). Twitter: A good place to detect health conditions. *PLoS ONE*, 9(1), e86191. <http://dx.doi.org/10.1371/journal.pone.0086191>
- Ramírez-Esparza, N., Chung, C. K., Sierra-Otero, G., & Pennebaker, J. W. (2012). Cross-cultural constructions of self-schemas: Americans and Mexicans. *Journal of Cross-Cultural Psychology*, 43, 233–250. <http://dx.doi.org/10.1177/00220221110385231>
- Reissing, E. D., Binik, Y. M., Khalifé, S., Cohen, D., & Amsel, R. (2003). Etiological correlates of vaginismus: Sexual and physical abuse, sexual knowledge, sexual self-schema, and relationship adjustment. *Journal of Sex & Marital Therapy*, 29, 47–59. <http://dx.doi.org/10.1080/713847095>
- Rellini, A. (2008). Review of the empirical evidence for a theoretical model to understand the sexual problems of women with a history of CSA. *Journal of Sexual Medicine*, 5, 31–46. <http://dx.doi.org/10.1111/j.1743-6109.2007.00652.x>
- Rellini, A. H., Ing, A. D., & Meston, C. M. (2011). Implicit and explicit cognitive sexual processes in survivors of childhood sexual abuse. *Journal of Sexual Medicine*, 8, 3098–3107. <http://dx.doi.org/10.1111/j.1743-6109.2011.02356.x>
- Sarwer, D. B., & Durlak, J. A. (1996). Childhood sexual abuse as a predictor of adult female sexual dysfunction: A study of couples seeking sex therapy. *Child Abuse & Neglect*, 20, 963–972. [http://dx.doi.org/10.1016/0145-2134\(96\)00085-3](http://dx.doi.org/10.1016/0145-2134(96)00085-3)
- Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods*, 7, 147–177.
- Scheff, T. J., & Retzinger, S. M. (2003). Shame, anger, and the social bond: A theory of sexual offenders and treatment. In M. Silberman & M. Silberman (Eds.), *Violence and society: A reader* (pp. 301–311). Upper Saddle River, NJ: Prentice Hall/Pearson Education.
- Shifren, J. L., Monz, B. U., Russo, P. A., Segreti, A., & Johannes, C. B. (2008). Sexual problems and distress in United States women: Prevalence and correlates. *Obstetrics and Gynecology*, 112, 970–978. <http://dx.doi.org/10.1097/AOG.0b013e3181898cdb>
- Stanton, A. M., Boyd, R. L., Pulverman, C. S., & Meston, C. M. (2015). Determining women's sexual self-schemas through advanced computerized text analysis. *Child Abuse & Neglect*, 46, 78–88. <http://dx.doi.org/10.1016/j.chiabu.2015.06.003>
- Stein, K. F., & Corte, C. (2008). The identity impairment model: A longitudinal study of self-schemas as predictors of disordered eating behaviors. *Nursing Research*, 57, 182–190. <http://dx.doi.org/10.1097/01.NNR.0000319494.21628.08>
- van Berlo, W., & Ensink, B. (2000). Problems with sexuality after sexual assault. *Annual Review of Sex Research*, 11, 235–257. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/11351833>.
- Westerlund, E. (1992). *Women's sexuality after childhood incest*. New York, NY: Norton and Co.
- Wolf, M., Chung, C. K., & Kordy, H. (2010). Inpatient treatment to online aftercare: E-mailing themes as a function of therapeutic outcomes. *Psychotherapy Research*, 20, 71–85. <http://dx.doi.org/10.1080/10503300903179799>

Received September 14, 2015

Revision received May 5, 2016

Accepted May 17, 2016 ■