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ORIGINAL PAPER

The Role of Family Environment and Multiple Forms of Childhood Abuse in the Shaping of Sexual Function and Satisfaction in Women

Martin Seehuus · Jessica Clifton · Alessandra H. Rellini

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Abstract Studies suggest that sexual self-schemas are an important cognitive mechanism in the sexual development of women with a history of childhood abuse. This literature is only beginning to explore how multiple forms of abuse (i.e., physical, emotional, and sexual), rather than sexual abuse alone, can influence the development of adult sexuality. Moreover, the extant literature has not carefully considered important factors other than the severity of the abuse that may relate to sexual self-schemas, including family environment and quality of romantic relationships. Findings from this cross-sectional study conducted on 417 heterosexual women (ages 18–25 years) suggest that family dynamics and different types of childhood abuse contribute both directly and indirectly to adult sexual function and satisfaction and that part of those effects were mediated by other factors such as sexual self-schemas and romantic relationship quality. These results, including an exploration of the direct and indirect effects, were discussed in terms of the pervasive effects of abuse on people's lives and the potential treatment targets that can be addressed when trying to reduce sexual problems in women with a history of abuse.

Keywords Childhood sexual abuse · Family environment · Sexual satisfaction · Sexual function · Structural equation modeling

Introduction

High rates of sexual dysfunction in women with a history of childhood sexual abuse (CSA) have sparked research that has led to interesting findings on the cognitive mechanisms of sexual functioning and satisfaction. In particular, accumulating evidence points to sexual self-schemas as key cognitive processes closely related to the sexual function of women with a history of CSA (Meston, Rellini, & Heiman, 2006; Reissing, Binik, Khalif, Cohen, & Amsel, 2003; Rellini, Ing, & Meston, 2011; Rellini & Meston, 2011). Self-schemas, including sexual self-schemas, are cognitive blueprints that shape how an individual interprets and responds to the world. Despite schemas being important aspects of modern models of sexual function in CSA survivors, developmental approaches to CSA have identified major limitations of these models in that they may ignore the potential role of family dynamics in adult well-being (Tromovitch & Rind, 2007). Moreover, while CSA is often assumed to be the most traumatic type of childhood maltreatment, recent data have pointed to even stronger correlations between other forms of abuse, such as emotional and physical abuse, and adult functioning (e.g., Rellini, Vujanovic, Gilbert, & Zvolensky, 2012; Teicher, Samson, Polcari, & McGreenery, 2006). Thus, although the literature provides a wealth of information on correlates of sexual abuse and sexual function in people with a history of childhood abuse, currently, no model takes into consideration the interaction between characteristics of the abuse, family factors, and cognitive processes, including schemas. By first reviewing the literature for how each of these factors is related to sexual function and satisfaction (and each other), we establish the basis for exploring a larger, more integrated model.

To the end of merging the extant literature with a more complex model that captures the relationship between childhood sexual abuse and adult sexual experience, we propose the Integrated Model of Abuse and Sexuality (Fig. 1). In this model, we propose a set of relationships between family environment, childhood abuse, sexual schemas, current relationship quality, and sexual function and satisfaction. In this model, we propose

M. Seehuus · J. Clifton · A. H. Rellini (✉)
Department of Psychology, University of Vermont, Dewey Hall, 2 Colchester Ave., Burlington, VT 05405, USA
e-mail: arellini@uvm.edu

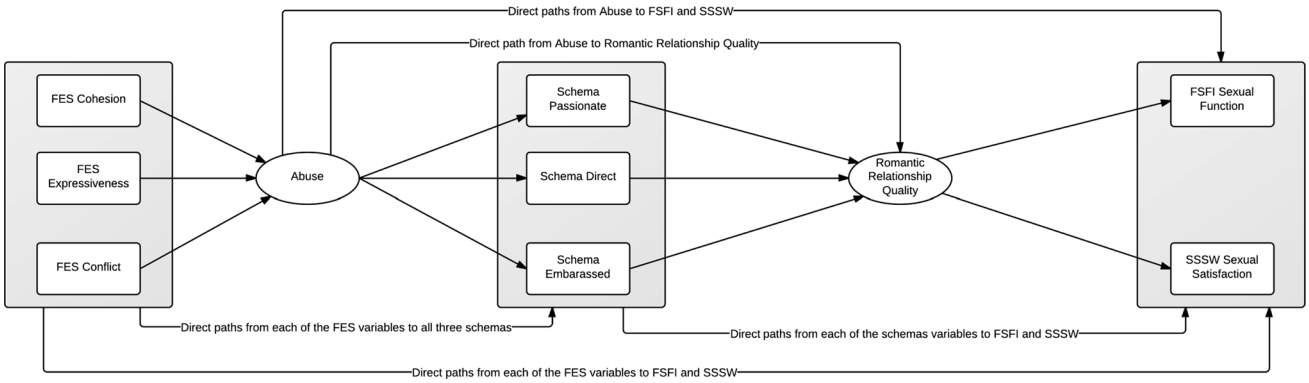

Fig. 1 Representation of the complete model. Covariances were estimated between variables in *grey boxes*. Note that *arrows* between *grey boxes* represent multiple modeled paths. For example, the *arrow* from the *grey* FES *box* to the *grey* Schemas *box* represents nine modeled paths

that these multiple factors contribute to adult sexual function and satisfaction both individually and as a set and that understanding these factors in relationship to each other uniquely adds to the extant understanding of both the impact of childhood factors on adult sexual experience and the mechanisms of that impact. The relationships proposed among the multiple factors of the model have already received support from the extant literature in pairs, but no study to date has tested the all of these factors simultaneously. Most of our understanding of these relationships is derived from studies using retrospective measures of family function and, therefore, introduce a retrospective influence bias that cannot easily be eliminated. Thus, both this study and the existing findings are, as authors of previous studies universally note, suggestive of a causal directionality, but do not require it or rule out other causal directions.

Family Dynamics

Dysfunctional family dynamics are important factors that are concurrent to experiences of sexual abuse but are often neglected in the literature on CSA and adult sexual function. Indeed, a common criticism of the literature is a tendency for researchers to study childhood sexual abuse outside the family environment. As correctly pointed out in the controversial article by Tromovitch and Rind (2007), sexual abuse is often a sign of an unhealthy family dynamic. Watson and Halford (2010) incorporated family environment and sexual satisfaction in their research of abuse, finding that women with a history of CSA reported poorer family functioning and less sexual satisfaction as compared to non-abused participants. Another study assessed both sexually abused and non-abused men and women, concluding that family environment (i.e., maternal care, family isolation, identification with mother, cohesion, and family functioning) influenced sexual adjustment and sexual attitude, independent of sexual abuse (Bhandari, Winter, Messer, & Metcalfe, 2011). This study was novel in modeling abuse, family environment, and later adult sexual adjustment; however, it was limited by the use of constructs of family environment that have yet to be validated. A greater understanding of the role of family dynamics could unveil differences in the types of sexual problems experienced by adult who experienced sexual abuse during childhood.

The scarce research on the effects of family environment on adult sexual functioning is surprising given that family characteristics in childhood have been linked with many aspects of adult functioning. Higher levels of parental support and knowledge of and about sexuality were related to a higher levels of sexual satisfaction in a large sample of Dutch adolescents (de Graaf et al., 2010). These findings were congruent with attachment theory (e.g., Mickelson, Kessler, & Shaver, 1997) which argues that early interactions with caregivers affect the way that individuals relate to others and the self. We would, therefore, expect that familial interactions would have an effect on self-schemas generally, including sexual self-schemas, since schemas are patterns of relating to the world, including important others. Given the relationship between sexual self-schemas and sexual function and satisfaction, it is feasible that early family environment has an influence on sexual function and satisfaction and that that effect is mediated by sexual self-schemas.

From the literature on family dynamics and adult well-being, we know that family characteristics that affect adult functioning include cohesion (involved or disengaged), expression of feelings (ability to express, cope, or resolve intense emotion), and conflict (avoided or open expression of hostility). People who report high family cohesion exhibit greater social adjustment, higher self-esteem, more life satisfaction, more positive evaluation of appearance, and more positive relations with others (Griffin & Amodeo, 2010; Scalf-McIver & Thompson, 1989). Those who report having low family cohesion in childhood also report greater guilt, and shame, as well as and more depressive symptoms, bulimic symptoms, problems with alcohol and distrust of their partner (Bailey, 1991; Griffin & Amodeo, 2010; Pulakos, 1996; Sprague & Kinney, 1997). People with families high in emotional expressiveness reported higher social adjustment, self-esteem, life satisfaction, and job satisfaction (Griffin & Amodeo, 2010; Sinacore-Guinn, Akçali, & Fledderus, 1999),

whereas low expressiveness has been linked with greater shame and guilt (Pulakos, 1996).

In support of the importance of early family environment in the formation of relationships, research has shown that, for women, less family conflict in childhood was associated with higher intimacy in adult relationships (Westervelt & Vandenberg, 1997). Additionally, greater family conflict has been associated with difficulties in social adjustment, self-esteem, depression, alcohol problems, and less altruistic love of one's partner (Griffin & Amodeo, 2010; Sinacore & Akçali, 2000; Sprague & Kinney, 1997). These studies clearly demonstrate that family environment significantly affects adult functioning both at the individual and dyadic level.

The majority of studies examining the effects of family on sexuality have focused on risky sexual behaviors in adolescents and young adults (Friedrich, Lysne, Sim, & Shamos, 2004; Kotchick, Shaffer, Miller, & Forehand, 2001; Miller, Forehand, & Kotchick, 1999). These studies have demonstrated the importance of family structure (i.e., socioeconomic status) and family process variables (i.e., communication) in sexual decision-making in young adults (for a review see, Kotchick et al., 2001). While little research has directly examined the connection between family environment and adult sexual function or satisfaction, the cumulative literature strongly supports the theory that such a relationship is worth exploring.

Physical, Emotional, and Sexual Abuse

The literature often assumes that sexual abuse is the only type of childhood maltreatment that affects adult sexuality. On the contrary, a study that carefully assessed different types of childhood abuse found that psychological abuse and neglect were strongly related to decreased marital trust for both men and women, but no type of childhood abuse (i.e., physical, sexual, psychological, or neglect) was singularly predictive of marital sexual satisfaction (DiLillo et al., 2009).

Physical, emotional, and sexual abuse can all independently affect sexual self-schemas. Indeed, any form of abuse during childhood is associated with lower sexual satisfaction (Rellini et al., 2012). In addition, it is more common for people with a history of sexual abuse to have experienced other forms of abuse than to have experienced one form of abuse alone (Rellini & Meston, 2007), which suggests that separately exploring types of childhood abuse by, for example, using participants who had experienced only one type of abuse may be unnecessarily limiting the generalizability of such a study. Therefore, a logical approach would be to consider all forms of childhood abuse, rather than sexual abuse alone, when investigating adult sexual functioning. Initial evidence for this approach comes from studies reporting an additive effect of these forms of abuse on sexual function and satisfaction (Rellini et al., 2012; Schloredt & Heiman, 2003).

Sexual Self-Schemas

Studies have shown that self-schemas can be effectively modified by psychotherapy (Kihlstrom & Cantor, 1984) and that can lead to changes in expectations and behavior (Beck, Freeman, & Davis, 2006; Young, 1994), thereby presenting an important target for sexual dysfunction treatment. Moreover, schemas are particularly relevant to the well-being of individuals with a history of childhood abuse because early formative experiences can have a strong influence on the individual's views of the self, the world, and the future (Beck & Alford, 2009; Putnam, 1990). Findings from cross-sectional studies support a model in which CSA leads to the development of more negative and less positive sexual self-schemas, including a view of the self as low on the passionate and high on the embarrassed dimensions. These schemas can lead to greater negative affect in anticipation of sex, which, given the documented relationship between negative affect and impaired sexual arousal, may result in sexual dysfunction and low sexual satisfaction (Meston et al., 2006; Rellini & Meston, 2011). Clearly, schemas play an important role in the sexual function and satisfaction of women in general and may provide an additional explanation for the sexual difficulties of individuals of childhood abuse. However, given that a number of factors are implicated in the shaping of schemas, it is simplistic to ignore mediators and other risk factors in the relationship between sexual self-schemas and sexual function/satisfaction.

Relationship Function

Based on the models for adult functioning provided by attachment theory (e.g., Mickelson et al., 1997), we speculate that an adult who experienced child abuse of any or all types to develop a distrust of important others, which could then alter her significant relationships, including romantic relationships. During a sexual encounter, a woman's inability to trust her partner may prevent her from freely expressing her needs or may inhibit her sexual pleasure, resulting in an overall dissatisfaction with her sexuality. The lack of trust, therefore, becomes a reason the individual experiences herself as unable to passionately love and connect to others and this may lead her to think of herself as lacking passion. In other words, any form of childhood abuse may affect sexual satisfaction and function by influencing sexual self-schemas (e.g., increasing the view of the self as non-passionate and unable to fully love someone) and/or by affecting the ability of the individual to develop functional romantic relationships. The relationship between childhood abuse, adult attachment style and adult interpersonal difficulties has been demonstrated in a variety of studies (Kersey, 2012; Kim, Talbot, & Cicchetti, 2009; Riggs & Kaminski, 2010), which support the idea of a connection between childhood abuse and adult interpersonal difficulties generally, whether mediated through trust or via another mechanism.

A relationship we posit in the Integrated Model of Abuse and Sexuality which has found much empirical support in the existing literature is that between sexual self-schemas, as operationalized and measured by the Sexual Self-Schema Scale for Women (Andersen & Cyranowski, 1994) and the ability of the individual to form functional relationships (Andersen & Cyranowski, 1994; Andersen, Cyranowski, & Espindle, 1999; Cyranowski & Andersen, 1998). For example, women with positive sexual self-schemas reported more extensive histories of previous romantic relationships and were more likely to be in a current relationship or to describe their relationship as "partnered or engaged" (Andersen & Cyranowski, 1994; Cyranowski & Andersen, 1998). They also reported being more passionate about their partners and did not avoid emotional intimacy in their relationships, as compared to women with more negative sexual self-schema. Women with a more negative schema reported higher anxiety about abandonment and feeling unloved compared to women with more positive schemas.

Sexual Function and Sexual Satisfaction

Much of the existing research discussed so far has explored the effects of these various factors on sexuality, as considered generally. Recent literature has highlighted the important complementary role of sexual function and sexual satisfaction, two aspects of sexuality that, although related, are orthogonal and independent contributors to adult sexual well-being. Sexual satisfaction has been defined as a subjective experience of sexuality and their sexual relationships (Lawrance & Byers, 1992), while sexual function has been defined as "a person's ability to respond sexually or to experience sexual pleasure" (American Psychiatric Association, 2013, p. 423). Thus, while there is overlap and a logical connection between the two constructs, the two are only incompletely related (Meston & Trapnell, 2005), with some women high on sexual function but low on satisfaction. Given their relatedness, however, a more complete model, such as the Integrated Model of Abuse and Sexuality, should describe a correlation between the two. Given their distinction, such a model should also allow them to vary independently.

The Integrated Model of Abuse and Sexuality

Combining these findings, we argue that when considering the sexual satisfaction and sexual function of individuals with a history of childhood abuse, four main factors need to be taken into consideration: (1) family dynamics, (2) type of childhood abuse, (3) sexual self-schemas, and (4) romantic relationship quality. Portions of this model have been tested previously, but the current study is novel in that it models several of these complex mediated relationships simultaneously. Based on the this, we hypothesized that (1) consistent with the theory and research described above, multiple types of abuse should be considered together when evaluating their effects; a combined measure of "abuse" consisting of physical, sexual, and emotional abuse will better describe these effects than a model that considered these factors separately. Within this hypothesis, we similarly predict that a latent measure of romantic relationship quality will provide the model with greater explanatory power than the inclusion of the measured subscales associated with that measure; (2) the inclusion in the model of sexual self-schemas will explain enough additional variability in sexual function and satisfaction to justify their presence; (3) the inclusion of romantic relationship quality will similarly be justified in increasing the model's explanatory power. Finally, we will use the best model of those tested to explore the direct and indirect relationships between the multiple predictors and sexual function and satisfaction.

Method

Participants

A total of 425 women were enrolled in the study based on eligibility criteria, including being between 18 and 25 years of age, reported prior partnered sexual activity, confirmed US citizenship (for compensation purposes), and fluency in English. Because we were assessing sexual function and the assessment of sexual function requires recent sexual activity, we excluded participants who reported no sexual activity for the past 4 weeks. Further, participants who had missing data on all independent and dependent variables (N = 8) were excluded, leaving 417 women for analysis. The mean age of participants was 21.7 years (SD = 2.7). A total of 23 % of participants were single, 69 % were in a committed relationship, and 8 % were either married or in a civil union. The majority (87 %) of participants identified as exclusively or predominately heterosexual and the remainder of participants identified as equally heterosexual and homosexual (5 %), or exclusively or predominately homosexual (8 %). Ethnicity was 88 % Caucasian, 4 % Multiracial, 4 % Hispanic, and 4 % Asian. See Table 1 for means, SDs and correlations of study variables.

Measures

Childhood Maltreatment

The Childhood Trauma Questionnaire (CTQ) is a 60-item questionnaire which has been shown to have six reliable and valid subscales: CTQ Physical Abuse, CTQ Sexual Abuse, CTQ Emotional Abuse, CTQ Physical Neglect, and CTQ Emotional Neglect (Bernstein & Fink, 1998). Each item was rated on a Likert scale ranging from 1 (*never true*) to 5 (*always true*). Internal consistency estimates range from acceptable to excellent for the subscales (Cronbach's $\alpha = 0.79$–0.94). In addition, test–retest reliabilities for each of the subscales were within an acceptable range (0.80–0.83). Convergent

Table 1 Zero-order correlations, means, and SDs for study variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. NRI companionship[a]															
2. NRI conflict[b]	.55														
3. NRI satisfaction[c]	.47	.33													
4. NRI intimacy[d]	.79	.55	.44												
5. CTQ physical abuse[e]	.16	.07	.12	.17											
6. CTQ emotional abuse[f]	.09	−.02	.04	.14	.60										
7. CTQ sexual abuse[g]	.08	.05	.02	.07	.39	.37									
8. FSFI full scale[h]	.11	.20	.10	.20	.01	−.06	−.06								
9. SSSW full scale[i]	.29	.34	.16	.37	−.10	−.20	−.08	.70							
10. SSS passionate[j]	.14	.15	.04	.22	.08	.01	.02	.29	.23						
11. SSS direct[k]	.04	.02	.15	.05	.18	.09	.03	.39	.22	.17					
12. SSS embarrassed[l]	.08	.04	−.10	.07	−.10	.02	−.00	−.18	−.23	.08	−.43				
13. FES cohesion[m]	.06	.05	−.01	.10	.31	.47	.24	.08	.01	.06	.03	.01			
14. FES expressiveness[n]	−.04	−.08	−.02	−.05	−.24	−.28	−.16	.04	.07	−.01	−.05	.06	.15		
15. FES conflict[o]	.06	.07	−.03	.05	.00	.03	.01	−.04	.00	−.02	−.13	.04	−.21	.08	
M	3.21	2.70	2.93	2.91	6.88	9.83	6.94	27.93	89.89	45.30	32.34	17.02	40.23	50.25	53.85
SD	0.77	0.58	0.49	0.86	3.36	4.71	4.44	4.84	19.97	7.02	8.31	6.78	10.61	8.32	7.44

Absolute range of scores: [a] 1–5; [b] 1–5; [c] 1–5; [d] 1–5; [e] 5–25; [f] 5–25; [g] 5–25; [h] 2–36; [i] 30–150; [j] 0–60; [k] 0–54; [l] 0–42; [m] 4–65; [n] 16–71; [o] 33–80

validity was confirmed by comparing the scores to a structured interview (Bernstein & Fink, 1998; Bernstein et al., 1994).

Sexual Self-Schema

The Sexual Self-Schema Scale (SSSS) is a 50-item questionnaire that consists of adjectives (26 scored and 24 fillers) and has reliably shown to measure an individual's perception of the self as a sexual being (Andersen & Cyranowski, 1994). The SSSS is divided into three factors: Open/Direct (Schema Direct, i.e., straightforward, frank), Passionate/Romantic (Schema Passionate, i.e., warm, loving), Embarrassed/Conservative (Schema Embarrassed, i.e., cautious, timid). Items were rated on a scale of 0 (not at all descriptive of me) to 6 (very much descriptive of me). The SSSS has shown good internal consistency (Cronbach's $\alpha = 0.82$) and high test–retest reliability ($r = .91$). In this study, we used the three schemas separately.

Sexual Functioning

The Female Sexual Functioning Index is a 19-item questionnaire that assesses overall sexual functioning as well as six subscales: Desire, Arousal, Lubrication, Orgasm, Satisfaction, and Pain (Rosen et al., 2000). Subscale response scores range from 0 to 6, with higher scores indicating higher function. The scale has demonstrated good internal consistency (Cronbach's $\alpha = 0.82$–0.92) and test–retest reliability ($r = .79$–$.88$). For this study, only the full-scale (Sexual Function), consisting of the sum of the subscales, was used. An inclusion criteria for our study was a positive report of sexual activity in the previous 4 weeks, thus, no participants scored 0 on any of the items.

Sexual Satisfaction

The Sexual Satisfaction Scale-Women (SSS-W) is a 30-item questionnaire with five subscales assessing sexual satisfaction: Communication, Compatibility, Contentment, Interpersonal, and Personal Distress (Meston & Trapnell, 2005). Example items include "I usually feel comfortable discussing sex" (Communication), "I feel my partner and I are not sexually compatible enough" (Compatibility), "I feel content with my present sex life" (Contentment), and "My partner is sexually unfulfilled" (Interpersonal Distress). Each item was rated on a Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Both internal consistency (Cronbach's $\alpha = 0.72$–0.80) as well as test–retest reliability ($r = .58$–$.79$) for the subscales have shown to be acceptable for both women with and without sexual dysfunction and relationship dissatisfaction. The full scale, consisting of the sum of the subscales, was used in this study (Sexual Satisfaction).

Romantic Relationship Quality

The Network of Relationships Inventory: Behavioral Systems Version (NRI-BSV) is a 36-item questionnaire that reliably measures relationship quality (Furman & Buhrmester, 2009). For the purpose of this study, only the Companionship, Conflict, Satisfaction, and Intimacy factors were used. Example items include "How much do you and this person spend free time together?"

(Companionship), "How much do you and this person disagree and quarrel?" (Conflict), "How much does this romantic partner have a strong feeling of affection toward you?" (Satisfaction), "How much do you share your secrets and private feelings with this romantic partner?" (Intimacy). Each item was rated on a Likert scale ranging from 1 (*little or none*) to 5 (*the most*). These four subscales were used to assess the quality of the romantic relationship (Romantic Relationship Quality). The internal consistency for the four subscales for romantic relationships range from acceptable to excellent (Cronbach's $\alpha = 0.78$–0.91).

Family Relationship Quality

The quality of interpersonal relationships within the family was assessed using the 27-item Family Relationships Index of the Family Environment Scale (FES: Moos, 1990; Moos & Moos, 1981). The Family Relationships Index consists of three subscales: Cohesion (i.e., "Family members really help and support one another"), Expressiveness (i.e., "We say anything we want to around home"), and Conflict (i.e., "We fight a lot in our family"). Each item was rated on a True/False scale. The internal consistency for the Family Relationship Index is good (Cronbach's $\alpha = 0.89$).

Procedure

Participants were recruited from across the United States via online classifieds (i.e., Craigslist). The advertisement indicated that a research project through the Psychology Department of a northeastern university was being conducted to investigate women's and men's sexuality, emotion, and childhood experiences. Individuals who were interested were provided a link to complete the online screening questionnaire.

After a six-item online screening questionnaire was completed to assess inclusion and exclusion criteria, individuals were invited through email to complete a 45-min online survey comprised of all questionnaires specified above. At the end of the study, participants could elect to enter a drawing in which they could receive $100 as compensation. Drawings were held to ensure that about 1 out of every 30 participants received payment.

Data Analytic Plan

The analysis was conducted in two parts: in the first, the measurement model was considered, including the evaluation of whether the use of latent variables to reduce model complexity was justified. In the second, the structural equation model as a whole was considered and multiple models were compared. A Full-information Maximum Likelihood (FIML) approach was used to manage the minimal amount of missing data in the final data set (for a discussion, see Graham, 2009).

Given the complex nature of the models, attempts were made to reduce the number of variables considered to maximize interpretability. To that end, the factor structures of the subscales of the CTQ, NRI, and FES were separately explored to determine if the use of one or more latent variables was warranted. Since the present study explored the sequelae of childhood abuse, the focus of the factor analysis for the CTQ was to determine if the three abuse subscales (CTQ Physical Abuse, CTQ Emotional Abuse, and CTQ Sexual Abuse) measured a single latent variable. The CTQ Full Scale was not used since it also accounts for childhood neglect and the present study was focused on the effects of abuse as opposed to neglect. For purposes of this analysis, the individual subscales of the Sexual Self-Schemas scale were treated as orthogonal, allowing each participant's scores to vary freely across subscales. For that reason, although the original scale combined the three schema scores into a single scale that primarily captured positive/negative valence, no attempt was made to combine schema scales into a single measure, either as originally intended or using a latent variable. Similarly, since the FSFI and SSS-W already have validated and meaningful full-scales, there was no need to pursue a simplified factor structure for those measures. The subscales of all measurements were not used both because the main scales have stronger empirical support and to minimize the number of paths being tested.

We explored each of the three hypotheses by comparing structural equation models that were designed consistent with each premise–for example, for Hypothesis 1, Model 1 included separate observed measures for different types of childhood abuse and the separate subscales of the Network of Relationships Inventory was compared to a model that replaced those individual observed subscales with a latent Abuse variable and a latent Relationship quality variable (Model 4). If the model with the latent variables showed stronger overall model fit, we interpreted that as support for the replacement of the individual observed subscales with a latent variable.

Results

Table 1 shows correlations, means, and SDs of all study variables.

Measurement Model

Three confirmatory factor analyses (CFAs) were conducted to explore whether Abuse was adequately measured by CTQ Physical Abuse, CTQ Emotional Abuse, and CTQ Sexual Abuse; Romantic Relationship Quality was adequately measured by NRI Companionship, NRI Conflict, NRI Satisfaction, and NRI Intimacy; and Family Relationship Quality was adequately measured by FES Conflict, FES Expressiveness, and FES Cohesion. The subscales for each measure were first

Table 2 Summary of model fit for confirmatory factor analyses of Abuse (using the Childhood Trauma Questionnaire, CTQ), Romantic Relationship Quality (measured using the Network of Relationships Inventory, NRI) and Family Relationship Quality (measured using the Family Environment Scale, FES)

	Model	χ^2	CFI	TLI	SRMR	RMSEA	RMSEA <.05
Abuse	One factor	$\chi^2(5) = 53.76, p < .05$	0.94	0.87	0.05	0.16	0.00
	Two factor	$\chi^2(1) = 0.31, p > .5$	1.0	1.0	0.00	0.00	0.72
Romantic relationship quality	One factor	$\chi^2(2) = 0.39, p > .8$	1.0	1.0	0.00	0.00	0.92
Family relationship quality	Model did not converge						

The model for the CFA of family relationship quality (using the Family Environment Scale) did not converge. Models with more factors than those shown did not converge, and thus no fit statistics were generated. Measures of model fit, for this table and following tables, are as follows: χ^2 is a measure of model misfit, with non-significance being consistent with a well-fitting model. CFI is Comparative Fit Index; values of >0.90 are consistent with a well-fitting model. TLI is the Tucker–Lewis Index; values of >0.95 are consistent with a well-fitting model. SRMR is the standard room mean square residual; values of <0.08 are consistent with a well-fitting model. RMSEA is the root mean square error of approximation; values of <.01 are consistent with excellent fit, <.05 with good fit and <.08 are acceptable fit. RMSEA <.05 is the calculated odds that RMSEA is less than .05

entered in separate CFAs before being considered as part of the overall model.

In order to determine if a single latent factor measuring Abuse was well-measured by the CTQ Abuse subscales, or if either the individual subscales as observed or a latent factor including the neglect subscales better modeled these data, a factor analysis was conducted with all five CTQ subscales, even those including neglect that were not theoretically related to our model. We included neglect factors to provide a more comprehensive picture of the scale as a whole, independently from our theoretical model. A two-factor model had the strongest fit (see Table 2 for fit statistics and Table 3 for factor loadings). Factor 1 included all abuse subscales and the CTQ Physical Neglect subscale. Since this model was intended to test the effects of abuse but not neglect, we assessed the loading when the CTQ Physical Neglect was excluded and found that the loadings did not change meaningfully when only the three CTQ abuse variables were used to measure a latent Abuse variable (see Fig. 2 for the loadings of the measurement model in the context of the SEM model). Thus, as supported theoretically above, CTQ Physical Neglect was excluded from the model and not further considered.

For Romantic Relationship Quality, the NRI subscales were entered in a CFA to determine if a single latent factor could be used instead of the individual subscales. A single-factor model demonstrated excellent model fit (see Table 2) and had loadings above .40 for all subscales (see Table 4) and thus a latent variable Romantic Relationship Quality was used in the final model in the place of the individually-measured subscale scores.

No CFA model successfully converged for the subscales of the FES, which suggests that the subscales are already capturing an appropriate factor structure for the FES. For that reason, the individual subscales were entered in the model individually.

Structural Equation Model

Four models were compared. All four models considered the relationship between the three FES subscales and Abuse and, as outcome measures, Sexual Function and Sexual Satisfaction.

Table 3 Factor loadings for the final CFA for childhood trauma

Subscale	Factor 1	Factor 2
CTQ physical abuse	0.82	–
CTQ sexual abuse	0.49	–
CTQ emotional abuse	0.49	–
CTQ physical neglect	0.64	0.15
CTQ emotional neglect	–	0.99

Loadings of less than 0.10 are not shown. Loadings of less than 0.40 are generally not interpreted. Models with more than two factors did not converge

Model 4 estimated paths from the three FES subscales to the latent variable Abuse, the three sexual self-schemas, Sexual Satisfaction, and Sexual Function. Paths were estimated from Abuse to sexual self-schemas, Sexual Satisfaction, and Sexual Function. The three sexual self-schemas were theorized to predict the latent variable Romantic Relationship Quality and Sexual Satisfaction and Sexual Function. Finally, paths from Romantic Relationship Quality to Sexual Satisfaction and Sexual Function were estimated. Correlations between the three FES subscales, the three sexual self-schemas, Sexual Satisfaction, and Sexual Function were also modeled. See Fig. 1 for a visual representation of the complete model. In Models 1–3, variants of this model were tested, each corresponding to a numbered hypothesis.

In Model 1, the latent variables Abuse and Romantic Relationship Quality were replaced by their observed subscales in order to determine if the interpretive parsimony of the model in which latent variables came at the cost of reduced explanatory power. In Model 2, the three sexual self-schemas were removed from the model by having all of the relationships between the schemas and other model variables fixed to zero. A test of this model against a model in which the three sexual self-schemas were used would determine if including the schemas in the model added a significant amount of explanatory power. Model 3 tested whether the inclusion of the latent variable Romantic

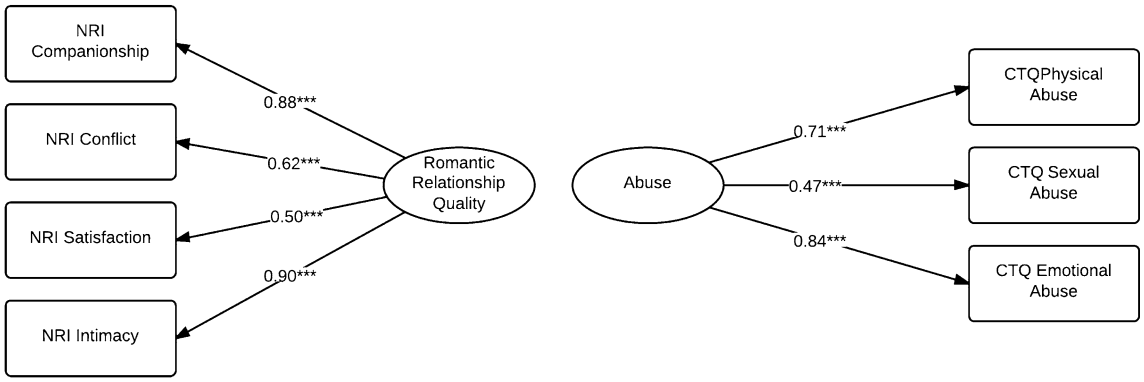

Fig. 2 Measurement portion of Model 4 with factor loadings and significance indicators. Latent variables are shown in *ellipses* and observed variables are shown in *rectangles*. Loadings differ from those in the two EFAs because the model is simultaneously accounting for the relationships between latent variables and other variables in the model. $*p<.05$; $**p<.01$; $***p<.001$

Table 4 Factor loadings for the final EFA for romantic relationship quality

Subscale	Factor 1
NRI: companionship	0.90
NRI: conflict	0.62
NRI: satisfaction	0.51
NRI: intimacy	0.88

Loadings of less than 0.10 are not shown. Loadings of less than 0.40 are generally not interpreted. Models with more than one factor did not converge

Table 5 Fit statistics for alternative models

Model	AIC	BIC	*df*	χ^2	RMSEA	CFI	SRMR
1	27,894.64	28,432.13	0		0.00	1.00	0.00
2	28,019.78	28,262.64	74	273.14	0.08	0.85	0.08
3	27,922.74	28,213.38	62	152.10	0.06	0.93	0.08
4	27,864.86	28,191.34	53	76.221	0.03	0.98	0.03

Relationship Quality was justified by an increase in the explanatory power of the model, using the same technique as with the sexual self-schemas above. Model 4 included all of the paths described in Fig. 2. See Table 5 for a summary of fit statistics for the models considered.

Since Model 1 was fully saturated, it could not be compared to other models using a χ^2 difference test. Using both AIC and BIC to compare model fit, however, suggested that Model 1 has worse fit than Model 4. As predicted by Hypothesis 1, this suggests that the use of the latent variable Abuse instead of the individual abuse variables and the inclusion of the latent variable Romantic Relationship Quality instead of the individual relationship variables was justified and, in fact, was better descriptive of the data.

For Hypotheses 2 and 3, Chi square difference tests were conducted comparing Model 4 with Models 3 and 2. The improvement of fit from Model 2 to Model 4 was significant, $\chi^2(21)=196.9$, $p<.001$, suggesting that Model 4 has significantly better fit, which, in turn, suggests that the inclusion of the three sexual self-schemas in the model added significantly to its explanatory power. This means that the sexual self-schemas accounted for a meaningful amount of variability in the model and that, consistent with Hypothesis 2, their inclusion was justified. The improvement of fit from Model 3 to Model 4 was also significant, $\chi^2(9)=75.88$, $p<.001$, suggesting that the inclusion of Romantic Relationship Quality accounts for a meaningful portion of the overall variance, which supports Hypothesis 3's prediction that Romantic Relationship Quality was an important factor to include in the model.

Consistent with both the χ^2 difference tests and a comparison of AIC and BIC values, along with other measures of model fit, Model 4 was determined to best describe these data. The significant paths of Model 4 can be seen in Fig. 3. Using criteria from multiple tests of model fit, Model 4 had excellent model fit, with an RMSEA (root mean square error of approximation) of 0.03, which is less than the often-used rule of thumb of <.05. The percent chance of the actual RMSEA being less than .05 was calculated to be .96. Similarly, the CFI (Comparative Fit Index) of .98 was greater than the rule of thumb of .90, The SRMR (Standard Root Mean Square Residual) of .03 was less than its rule of thumb of .08, and the Chi square test of badness of fit was significant at $\chi^2(53)=76.24$, $p<.05$. The only indicator of fit that did not support good fit was the χ^2 test, which may be unnecessarily sensitive at sample sizes such as those in this model (Bentler & Bonett, 1980). Figure 3 shows the direction and significance level of the estimated model parameters.

Indirect Effects

Table 6 shows the indirect effects estimated for Model 4. Only those effects found to be statistically significant were included in the table. Table 6 also lists the percent of the absolute total effect that was accounted for by one or more indirect effects. This value can be interpreted as a measure of the extent to which mediation

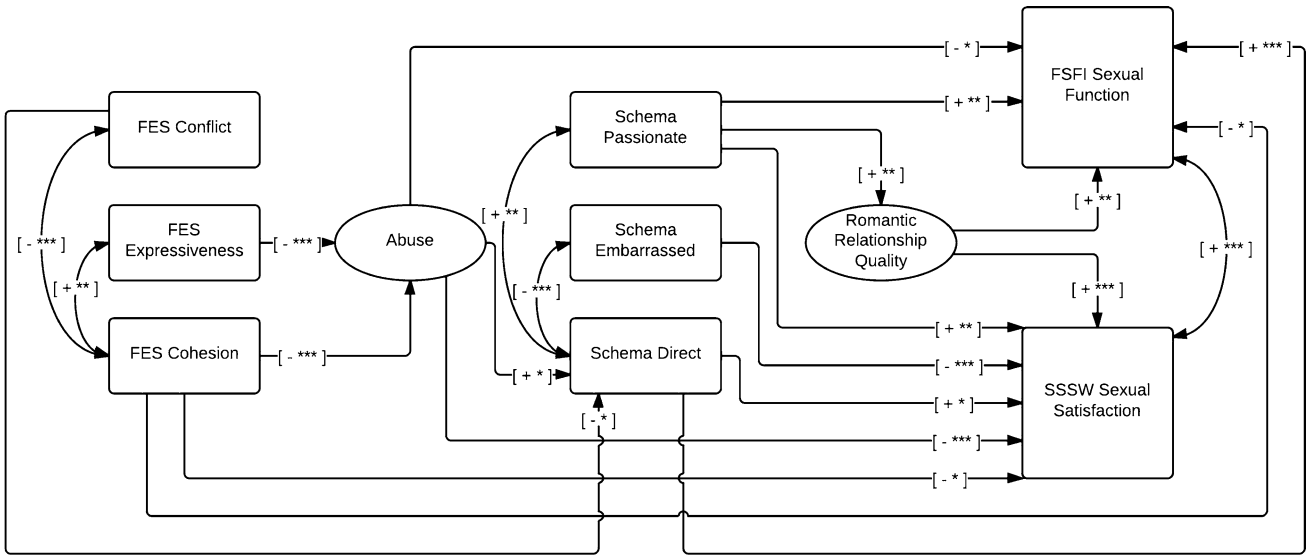

Fig. 3 Model 4. Only significant paths are shown; other paths were modeled and are described in Fig. 1. The observed variables measuring the latent variables are not shown for simplicity of presentation; see Fig. 1 for an illustration of the measurement model. Measurement error terms are not shown. Latent constructs are shown in *ellipses* and observed variables are shown in *rectangles*. The *codes in brackets* on each *line* indicate direction and significance level of relationship; + = positive; − = negative; *$p < .05$; **$p < .01$; ***$p < .00$

is partial or complete; the more complete the mediation is, the higher the percent of the effect accounted for by the indirect path(s). None of the indirect effects described in Table 6 were classically complete mediation, in which the direct effect became non-significant when considering the indirect effect. Significance was assessed using bootstrapping (Preacher & Hayes, 2008; Hayes, 2009), as opposed to the "four steps" approach (Baron & Kenny, 1986), both for increased statistical precision and because of the likelihood of suppression. Given the very large number of indirect paths, Table 6 does not present non-significant indirect paths and thus the sum of effects of the listed indirect paths may not equal the total indirect effect.

Of particular note is that there were a number of examples of suppression, in which the direct effect was in the opposite direction of the indirect effect. For example, the direct relationship between FES Cohesion and Sexual Satisfaction was significant and negative, while the indirect effect of FES Cohesion on Sexual Satisfaction by way of Abuse was significant and positive, leaving the net result close to zero. Similarly, the direct relationship between Abuse and Sexual Function was negative and significant, with more Abuse being associated with lower levels of Sexual Function, but this effect was partially suppressed by the positive indirect path through Schema Direct, resulting in a non-significant total effect (Table 7).

Discussion

This study demonstrated that family environment, childhood abuse, sexual schemas, and romantic relationship quality were all related to adult sexual function and satisfaction, with each factor related to the ones before it. This supports the proposed Integrated Model of Abuse and Sexuality (Fig. 1). Findings from this study add to the extant literature supporting the theory that the relationship between childhood abuse and later sexual difficulties in adult women is a complex one, with multiple mediators and predictive factors. Data collected in this study confirmed results from prior research (Castellini et al., 2013; Rellini, McCall, Randall, & Meston, 2005; Schloredt & Heiman, 2003) which found that sexual abuse is only one type of childhood abuse that influences adult sexuality. Sexual abuse, physical abuse, and emotional abuse each measured the latent variable of childhood abuse, which, in turn, had a distinct effect on sexual function and satisfaction. Unlike previous studies, the quality of the current romantic relationship, although related to sexual function and satisfaction, was not significantly associated with a history of childhood abuse. Schema Direct was associated with family factors and abuse, which, in turn, was associated with sexual satisfaction although the other two schemas explored, Schema Passionate and Schema Embarrassed, were not related to family function or abuse. Schema Passionate was related to both sexual function and satisfaction; Schema Embarrassed was only related to sexual satisfaction.

Our findings support a unique influence of family dynamics on sexual function and satisfaction, independent from childhood abuse. Specifically and surprisingly, Family Cohesion had a direct and negative effect on both Sexual Function and Satisfaction although the total effect, considering the indirect pathways, was negligible. This direct pathway was remarkable considering that the effect of family dynamics on sexual

Table 6 Significant indirect effects predicting sexual satisfaction or sexual function

Path	Effects			Significant indirect paths(s)	
	Total	Direct	Indirect	Path	Parameter
Variables predicting sexual satisfaction					
From family cohesion	ns	−0.19*	0.16** (46 %)		
				Family cohesion through abuse to sexual Satisfaction	0.20***
From family expressiveness	ns	ns	ns	None	
From family conflict	ns	ns	ns	None	
From abuse	−0.30***	−0.41***	ns	None	
From schema passionate	0.23***	0.15**	0.08** (39 %)		
				Schema passionate through relationship quality to sexual satisfaction	0.08**
From schema direct	0.14*	0.12*	ns	None	
From schema embarrassed	−0.20**	−0.23***	ns	None	
Variables predicting sexual function					
From family cohesion	ns	−0.17*	ns		
				Family cohesion through abuse to sexual function	0.11*
From family expressiveness	ns	ns	ns		
From family conflict	ns	ns	ns		
				From family conflict through schema direct to sexual function	0.05*
From abuse	ns	−0.22*	0.10* (31 %)		
				From Abuse through schema direct to sexual function	0.06*
From schema passionate	0.23***	0.20**	0.03* (13 %)		
				From schema passionate through relationship quality to sexual function	0.03*
From schema direct	0.35***	0.34***	ns	None	
From schema embarrassed	ns	ns	ns	None	

The absolute percent (not accounting for the directionality of the effect) of the total effect accounted for via all indirect paths is shown in parentheses after the parameter estimate for the Total Indirect Effect. Significant indirect paths do not add up to the total indirect effect due to the influence of other, non-significant indirect paths; this also means that some sets of endpoints may have a net non-significant indirect effect, yet have significant individual indirect paths. Direct and indirect effects in opposite directions are examples of suppression. All parameter estimates shown are standardized

*$p < .05$; **$p < .01$; ***$p < .001$

function and satisfaction was significant and independent from the effects of abuse, highlighting the importance of considering the family history of women with sexual problems.

These findings should be interpreted cautiously, particularly in light of the near zero net effect of Family Cohesion when considering the indirect effects. Of note, however, was that this direct relationship was broadly congruent with the focus on the importance of family history in many treatment manuals (Heiman, LoPiccolo, & LoPiccolo, 1988). Studies on HIV and risky sexual behaviors have also provided convincing evidence that beliefs and attitudes held by parents have an important shaping effect on the beliefs and attitudes of children (Kotchick et al., 2001; Miller et al., 1999) although the direction of the direct effect is counterintuitive. One explanation is that Family Cohesion is related to an overinvolvement with family of origin to the extent that this interferes with individuation and otherwise healthy adult relationships. Although a few studies have examined the relationship between family environment and adult sexual function and satisfaction, those studies have not explored the topic using more complex family environment measurements and sophisticated statistical techniques, as did the present study. Considering the counterintuitive direction and the non-meaningful total effect of Family Cohesion on Sexual Satisfaction and Sexual Function, however, we primarily interpret these results as a call for more research on the topic.

Other aspects of family environment, including expressiveness and conflict, were indirectly associated with sexual function and satisfaction. FES Expressiveness, the ability to express

Table 7 Standardized coefficients and *p* values for all significant paths

Predicted	Predictor	Standardized coefficient	Significance
Abuse			
	Family cohesion	−0.49	<0.01
	Family expressiveness	−0.26	<0.01
Schema passionate			
Schema embarrassed			
Schema direct			
	Abuse	0.18	0.02
	Family conflict	−0.13	0.02
Romantic relationship quality			
	Schema passionate	0.18	<0.01
Sexual function			
	Abuse	−0.22	0.01
	Schema passionate	0.20	<0.01
	Schema direct	0.34	<0.01
	Romantic relationship quality	0.17	<0.01
Sexual satisfaction			
	Family cohesion	−0.19	0.01
	Abuse	−0.40	<0.01
	Schema direct	0.12	0.03
	Schema embarrassed	−0.23	<0.01
	Schema passionate	0.15	0.01
	Romantic relationship quality	0.42	<0.01

* $p < .05$; ** $p < .01$; *** $p < .001$

emotions openly to family members, was negatively associated with abuse. This is most likely an indication that an essential characteristic of an environment promoting expression of emotions is safety, something undermined in children who experience abuse. That is, women who experienced abuse may have felt less safe and thus less able to express themselves in a family environment. Interestingly, FES Expressiveness was not associated with Schema Direct, which includes a tendency to communicate sexual thoughts and feelings. One interpretation is that it may be that negative aspects of a measure are more effective at predicting negative outcomes (e.g., FES Conflict predicting lower levels of Schema Direct) than are positive aspects (FES Cohesion) predicting positive outcomes (higher levels of Schema Direct) although further exploration would be required to confirm this. It is also possible that people who grow up in an abusive environment are able to learn to selectively distrust family members while having the potential to be open to sexual partners about their thoughts and feelings about sexuality.

The presence of conflict in the family during childhood was associated with less open sexual self-schemas. This may indicate that fear of conflict developed during childhood may then prevent women from expressing their sexual preferences (among other things) for fear of disagreement with their partner. These interpretations should be considered preliminary, particularly given that the measurement of dynamics of family of origins was retrospective; therefore, it is unclear whether these family characteristics were indeed described reliably or people's interpretations changed with time. Future longitudinal studies that assess family dynamics in childhood would be better suited to investigate the causal relationship proposed by these interpretations, and such research should similarly consider some of the more subtle aspects of these findings, such as distinctions between the effects of types of abuse.

Similarly to previous studies (Meston et al., 2006; Rellini & Meston, 2011), we observed a significant association between Abuse and Sexual Function and Sexual Satisfaction through the effects of Abuse on sexual self-schemas. Interestingly, several aspects of sexual self-schemas not associated with Abuse were independently associated with Sexual Function and Satisfaction. It is noteworthy that the direct effects of Abuse on Sexual Functioning and Satisfaction were negative, as expected, with more severe forms of abuse showing an association with lower sexual function and satisfaction. However, the relationship between childhood abuse and sexual function and satisfaction via the sexual self-schemas was positive, with more abuse being associated (via self-schemas) with more satisfaction and function. In particular, we observed a direct relationship specifically between Abuse and Schema Direct. This was a positive relationship, suggesting that individuals who reported more pervasive abusive environments also experienced themselves as more open and direct about their sexuality. This may be reflective of the way in which the higher levels of Schema Direct associated with a history of abuse may partially mitigate the negative impact of abuse generally. An open and direct schema is suggestive of an individual who is forthright about sex and sexual preferences, and thus it is consistent with prior research that an individual exposed to sexual abuse may be more disinhibited in their expression of sexuality (Browne & Finkelhor, 1986; Finkelhor & Browne, 1985). People who are more open about their sexuality are also more able to express their sexual needs and therefore may be more likely to have their needs met (Kelly, Strassberg, & Turner, 2006; Rellini et al., 2012). Thus one consequence of sexual abuse observed in some women—a less inhibited approach to sexuality generally—may reduce some of the negative effects of abuse generally.

Therefore, the finding that a more open sexual self-schema was associated with better sexual function and satisfaction are in agreement with prior research. Also, individuals who reported greater open/direct sexual self-schemas also reported feeling more passionate and less embarrassed about their sexuality. These two variables were also associated with sexual function and satisfaction with greater passionate sexual self-schemas predicting higher scores in sexual function/satisfaction, and greater embarrassment predicting lower scores. This was also in agreement with prior literature on sexual self-schemas and

sexual function (Andersen et al., 1999; Andersen & Cyranowski, 1994; Cyranowski & Andersen, 1998). However, these findings also paint a paradoxical relationship between childhood abuse and sexual function and satisfaction.

These results should be interpreted within the context of the observed direct effect of childhood abuse on sexual function and satisfaction, which was negative. Thus, the most conservative way to interpret these results is that childhood abuse has negative effects on adult sexuality, and the effects of abuse on schemas influence sexual function and satisfaction in a complex way, perhaps by activating some systems that are normally associated with greater sexual satisfaction but that could also represent the development of other, more successful coping strategies, such as sexual directness, which may have the dual effects of managing the sequelae of sexual abuse and improving overall satisfaction. The complexity of the relationship between sexual self-schemas and sexual function can be observed in the mixed results of prior studies, some of which reported that passionate and embarrassed sexual self-schemas were positively associated with sexual function and others reporting a negative relationship (Cyranowski & Andersen, 1998; Kuffel & Heiman, 2006). This disagreement is likely a sign of important moderating factors that we have yet to identify.

We expected to find that different factors would predict sexual function than those that predicted sexual satisfaction. This hypothesis was based on previous studies that pointed to differences in the predictors of sexual function and satisfaction of women with a history of sexual abuse (Rellini et al., 2011; Stephenson, Hughan, & Meston, 2012). We were surprised to find an almost perfect match in the factors associated with sexual function and satisfaction, with the exception of Schema Embarrassed, which affected sexual satisfaction but not sexual function. One way to understand this finding is that the embarrassed/conservative sexual self-schema is associated with increased guilt and discomfort with one's own sexual experiences; thus, women who are more embarrassed about their sexuality may find less satisfaction in it, even if the "mechanics" of sexuality remain functional. This finding should be explored further in future research both to better understand the differences in sexual function and satisfaction and to better understand their predictors.

A number of limitations need to be noted when interpreting the findings from this study. Most fundamental is that this study was cross-sectional in nature. Although the model that best fit both data and theory places factors such as family dynamics, childhood abuse, sexual self-schemas, relationship quality, and sexual function and satisfaction in that temporal order, information about these factors was gathered simultaneously. Only a long-term longitudinal study that examines family dynamics, the development of sexual self-schemas, romantic relationship dynamics, and sexual function each separately and contemporaneously could speak authoritatively to causal factors. Such a study could also address memory biases, since it is also possible that a history of some types of abuse could alter present perceptions of past family dynamics. Such a study, however, would involve long-term, very intimate access to a very large number of participants, and is thus probably infeasible.

In addition, even though the latent variable Abuse showed good loadings for physical, sexual and emotional abuse, and the model that replaced the latent variable with its measured components did not show different patterns of relationships for the various types of abuse, it is still possible that the influence of those types of abuse could vary depending on other factors. For example, it is possible that the identity of the perpetrator or the age of abuse onset may have an impact and may interact with their effects on sexual outcomes. Such interaction effects, if they exist, could introduce further subtlety into the model and, as such, would likely require a much larger sample and more detailed descriptions of the types of abuse.

The measurement of sexual function and satisfaction by necessity introduces some additional limits to the generalizability of the study. In particular, they require participants be sexually active relatively recently, since function and satisfaction cannot be measured without a relatively recent "trial." Women who have not recently been sexually active, either by choice, happenstance or due to sexual dysfunction, are necessarily excluded, and thus these results may or may not apply to women in those circumstances.

Finally, this study did not consider the identity of the perpetrator of the abuse experienced by its participants. It is possible that abuse perpetrated by a family member could have a differential effect on a retrospective report of family dynamics than abuse perpetrated by a non-family member–and thus skew reports of family dynamics or that the identity of the abuser could moderate some or all of the effects that abuse had on other study variables. Future research should consider using longitudinal techniques that would allow for such analyses to be made.

In conclusion, this study corroborated the accumulating evidence (Messman-Moore & Brown, 2004; Rellini & Meston, 2007, 2011; Schloredt & Heiman, 2003) that sexual abuse is not the only type of childhood abuse that can negatively affect adult sexual functioning. From the complex picture described by our data, it appears that there is more than one way through which childhood abuse affects sexual functioning. Most importantly, it appears that we are only at the beginning of our exploration of adult sexuality in childhood abuse survivors. A paucity of studies have investigated this topic and the large majority of those studies have focused on sexual self-schemas. It appears from this more complicated analysis of the relationship between family environment, abuse, schemas and relationship quality, that sexual self-schemas, while important for understanding sexual function and satisfaction, may not provide a sufficient explanation of the mechanisms at play in the sexual dysfunction of individuals with a history of childhood abuse. The recent focus of scholars on transdiagnostic models of psychopathology raises the question of whether investigating

cognitive and emotional vulnerabilities that are associated with conditions highly comorbid with sexual function (i.e., depression, PTSD, social phobia, panic disorder, obsessive compulsive disorder, eating disorders) may be a more fruitful direction to provide a better explanation of the underlying mechanisms of sexual problems in adults with a history of childhood abuse.

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