Childhood Cancer Survivor Study
Concept Proposal and Analytic Plan

Study Title:
Examining Psychometric Properties of Sexual Self-Schema for Female Cancer Survivors and Siblings

Primary Working Group: Psychology
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BACKGROUND

Sexual dysfunction is prevalent and distressing among childhood cancer survivors. By many estimates, more than half of childhood cancer survivors experience some level of sexual health difficulty, with women at greater risk for sexual health concerns than men.[1,2] Though it is rarely addressed in standard clinical practice,[3] sexual dysfunction is unquestionably linked to emotional distress and poor quality of life for childhood cancer survivors.[1,4] Females experiencing persistent sexual side-effects of treatment may be particularly at risk for longstanding emotional distress,[5] as sexual difficulties may be reminders of cancer treatment and interruptions to intimate relationships or family planning.[2]

Sexual self-schema capture a modifiable aspect of sexual well-being. Sexual well-being in cancer survivorship is multifactorial, often resulting from interactions between physical side-effects of treatment, relational resources, and cognitions about oneself as a sexual being.[3] The latter of these factors has been operationalized as "sexual self-schema."[6] Women's sexual self-schema are most often measured using the Sexual Self-Shema Scale (SSS), an easily-administered self-report questionnaire.[6,7] Initial validation of the SSS revealed 3 factors of women's sexual beliefs, including: 1) Passionate-Romantic; 2) Open-Direct; 3) Embarrassed-Conservative. These subscales may be used independently or as a total score of "positive vs. negative sexual self-schema", such that *high* scores on passionate-romantic and open-direct and *low* scores on embarrassed-conservative comprise a more positive sexual self-schema. Evidence suggests that positive sexual self-schema are negatively associated with sexual dysfunction among women *with* [8-10] and *without* [7,11] *cancer history*, such that women with greater openness to sexuality are less at risk for sexual difficulties.

The factor structure of the most common sexual self-schema measure has yet to be validated for childhood cancer survivors. Though the SSS is frequently used among female cancer survivors[8-10,12], the original factor structure was established decades ago in healthy female undergraduate students in the U.S.[7] In light of gradually evolving sexual norms for women over time, it is important to evaluate the psychometric properties of the SSS in the context in which it is administered. No studies to our knowledge have re-examined the SSS factor structure in clinical samples, though more recent research supports revised factor structures among healthy (i.e., no noted diagnosis of cancer or sexual dysfunction) adult females outside the U.S.[13,14] The *structure* of schema and worldviews is likely to differ as a function of both sample characteristics (e.g., cancer-exposed or not) and environment (e.g., social norms around sexuality at the time of measurement)[6] – as such, careful investigation of *measurement invariance (i.e., between-group differences in factor structure)* between samples with and without childhood cancer experience is needed. The Childhood Cancer Survivor Study

(CCSS) provides a unique opportunity to evaluate the factor structure of the SSS among a large, national sample of female survivors and siblings.

A cancer-specific sexual self-schema measure will inform much-needed intervention development efforts for female survivors of childhood cancer. Consistent with a diathesis-stress model of adjustment, in which one's personal predisposing characteristics interact with stress exposure to result in emotional difficulties,[15] sexual self-schema may moderate the extent to which cancer-related sexual health concerns drive emotional distress for cancer survivors.[9] Thus, sexual self-schema are a promising target of psychological intervention for survivors with stressful sexual health changes. Though individuals *with and without cancer history* experience distressing sexual dysfunction, survivors of childhood cancers may benefit from targeted supportive intervention approaches, given the significant contribution of cancer-related side-effects on survivors' sexual health.[1-3] Depending on each individual's specific concerns and personal schema, evidence-based intervention approaches may include cognitive reappraisal, acceptance, and self-compassion to mitigate the emotional, behavioral, and somatic sequelae of unhelpful thoughts about sexuality.[16,17]

Though no research to our knowledge has empirically tested sociocultural influences (e.g., religion, marital status, or pregnancy history) on sexual self-schema, culture has a major clinical impact on patients' priorities for sexual well-being that merits examination.[6] It should be noted that the sample of CCSS participants completing the SSS is limited in its inclusion of only survivors treated between 1970-1986 and captures beliefs about sexuality specific to the sociocultural context in which it was administered as part of the Women's Health sub-study (i.e., 2001-2003). As such, generalizability to the experiences of present-day cancer survivors, who may have different experiences with cancer treatment, survivorship care, and socialization around sexuality may be limited. Despite this limitation, however, the large, longitudinal CCSS dataset provides an invaluable opportunity to triangulate sexuality data collected as part of the Women's Health sub-study with measures of sociodemographic characteristics, life experience, and emotional function among both survivors and siblings. Findings of this study will inform continued, present-day investigation of the ways in which beliefs about sexuality are associated with quality-of-life outcomes for survivors exposed to all different types of life experience.

A person-centered approach to understanding sexual schema – perhaps relying on an adapted SSS as a clinical tool– is overdue, with clear implications for intervention design and measurement of cognitive-behavioral outcomes aligned with each patient's own models of sexuality. A brief, reliable sexual self-schema measure may be especially important for survivors of childhood cancers, who may have had limited opportunities to enjoy early sexual experiences before experiencing deleterious side-effects of cancer treatment (e.g., changes to fertility, body image, sexual dysfunction).[2] Evaluating correlates of SSS subfactors separately for both survivor and sibling participants in the CCSS will allow for a direct evaluation of the ways in which childhood cancer diagnosis may shape the formation of beliefs, values, and goals around sexuality later in life.

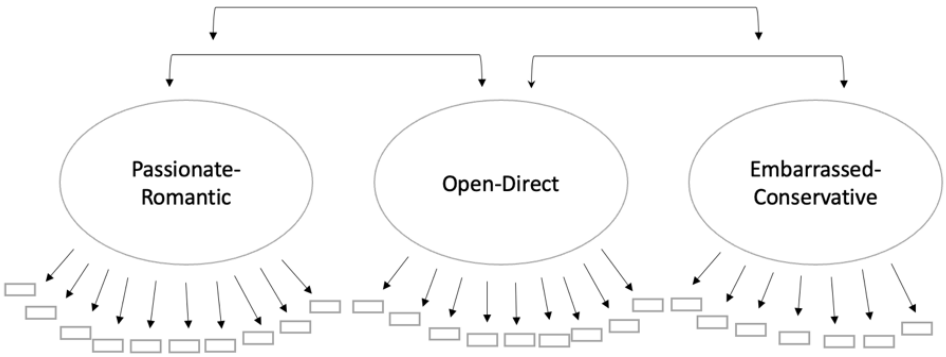
SPECIFIC AIMS AND STUDY QUESTIONS

1. Confirm the factor structure of the SSS, as measured among female survivors of childhood cancer and siblings as part of the Women's Health sub-study.

a. Do the CCSS data closely fit the hypothesized factor structure for the SSS, originally developed for healthy young adults?

b. Is the factor structure of the SSS invariant between survivor and sibling groups, or is there meaningful group difference in factor structure for this measure?

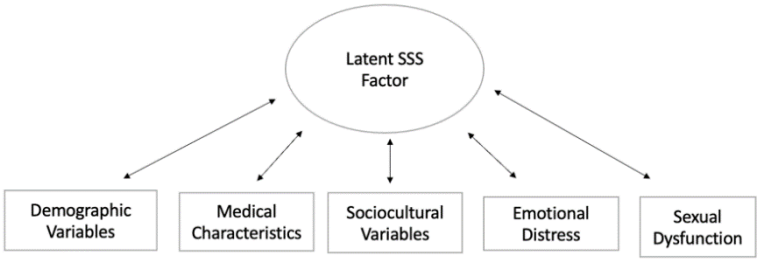
Figure 1. Confirmatory factor analysis of SSS (Aim 1)



2. Explore direct correlations of each extracted SSS factor with demographic (e.g., race, education level), medical (e.g., reproductive cancer, medical comorbidities), sociocultural (e.g., religion, partnership status), emotional (e.g., posttraumatic stress), and sexual function indices captured as part of the original Baseline and Follow-Up 2 CCSS surveys.

a. Do SSS factors vary based on these variables in survivor and sibling samples?

Figure 2. Correlations between each latent sexual schema and measured variables (Aim 2)

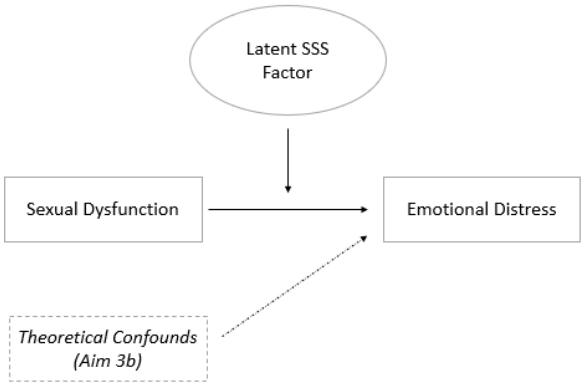


Please note that time-invariant data (e.g., cancer diagnosis and treatment exposures) will be collected from the baseline survey administered to the original CCSS cohort. We have selected Follow-Up 2 as the most appropriate timepoint for time-varying variables (e.g., quality of life, pregnancy) that were not also measured as part of the Women's Health Sub-Study (data collected from 6/27/01 through 1/23/03), as this is the follow-up psychosocial survey that most closely aligns with the timeframe during which data for the Women's Health Sub-Study were collected.

3. Test a diathesis-stress model of SSS factors as moderators of sexual function - emotional distress linkage.

a. *Without adjusting* for clinical variables that may confound the direct association between sexual dysfunction and distress, do each of the extracted SSS factors moderate the extent to which sexual function associates with emotional distress (health-related quality of life, PTSS, depression, anxiety, somatization) in survivor and sibling samples?

Figure 3. Stress-moderating hypothesis of sexual schema interacting with sexual dysfunction to predict emotional distress (Aim 3)



b. *Adjusting for clinical variables* that may theoretically confound the direct association between sexual dysfunction and distress (i.e., age at cancer diagnosis, presence of cancer-related scarring/disfigurement, CTAE severity of chronic health conditions, pregnancy history, use of oral contraceptives/hormone replacement therapy), do each of the extracted SSS factors moderate the extent to which sexual function associates with emotional distress (health-related quality of life, PTSS, depression, anxiety, somatization) in survivor and sibling samples?

METHODS

STUDY POPULATION. We plan to analyze CCSS data from both survivors and siblings. Specifically, this will include a subsample of 1) adult (≥ age 18) female cancer survivors and 2) adult female siblings of cancer survivors who provided baseline data and completed the second follow-up survey, as well as the Women's Health Questionnaire.

MEASURES. A summary of variables to be used for the proposed work is below.

Construct	Variable	Survey	Survivor/Sibling	Study Aim
Sexual Schema (Primary)	Sexual Self-Schema Survey (SSS)[7]	Women's Health	Both	Aims 1a, 1b, 2, 3a, 3b
Emotional Distress	SF-36 Health-Related Quality of Life[18]	Women's Health	Both	Aims 2, 3a, 3b
	Posttraumatic Stress Diagnostic Scale (PDS)[19]	Follow-Up 2	Both	Aims 2, 3a, 3b
	Depression, Anxiety, Somatization (BSI-18)[20]	Follow-Up 2	Both	Aims 2, 3a, 3b

Sexual Function	Sexual Function Questionnaire (SFQ)[21]	Women's Health	Both	Aims 2, 3a, 3b
Demographic	Race/ethnicity	Baseline	Both	Aim 2
	Personal Income	Follow-Up 2	Both	Aim 2
	Health Insurance	Follow-Up 2	Both	Aim 2
	Education level	Follow-Up 2	Both	Aim 2
	Employment	Follow-Up 2	Both	Aim 2
	Age at survey	Women's Health	Both	Aim 2
Medical	Age at diagnosis	Baseline	Survivor only	Aim 2
	Cancer diagnosis	Baseline	Survivor only	Aim 2
	Cancer-related scarring/disfigurement	Baseline	Survivor only	Aim 2, 3b
	Treatment exposures*	Baseline	Survivor only	Aim 2
	Chronic health conditions[22]^	Baseline	Both	Aim 2, 3b
	Ovarian failure	Baseline	Survivor only	Aim 2,3b
	Use of oral contraceptives/ hormone replacement therapy	Follow-Up 2	Both	Aim 2, 3b
Sociocultural	Religion	Baseline	Both	Aim 2
	Pregnancy history	Follow-Up 2	Both	Aim 2, 3b
	Lifetime history of infertility	Baseline	Both	Aim 2
	Past-month sexual activity vs. abstinence	Women's Health Questionnaire	Both	Aim 2
	Marital status	Follow-Up 2	Both	Aim 2
	Current sex partner	Women's Health Questionnaire	Both	Aim 2
	Sexual experience/orientation	Women's Health Questionnaire	Both	Aim 2

** Relevant treatment exposures may include pelvic radiation, cranial radiation, chemotherapy, surgery to sexual organs (breast, pelvis), amputation, hormonal treatments; ^Chronic health conditions will be rated according to the Common Terminology Criteria for Adverse Events (mild/grade 1 – fatal/grade 5).[23]*

ANALYTIC APPROACH. A preliminary outline of proposed analytic methods is below. We estimate that the study sample will include about 1658 female cancer survivors and 417 siblings with self-reported data—thus providing sufficient statistical power for large-sample analytic procedures. Prior to analysis, we will examine demographic characteristics of the CCSS survivor and sibling samples (e.g., age, sex, race, ethnicity) as compared to the SSS validation sample reported by Andersen and Cyranowski.[7] To explore the extent to which the available sample of CCSS participants may have been exposed to different life experiences than more recent samples of cancer survivors and siblings, we will also examine the demographic and medical characteristics of the CCSS sample, as well as their pattern of responses to the SSS, as compared to more recent clinical and healthy research samples reporting on their sexual self-schema.[9,24]

Aim 1: Confirm the factor structure of the SSS, as measured among female survivors of childhood cancer and siblings.

Confirmatory factor analysis (CFA) will be conducted separately for cancer survivors and siblings to determine the fit of the study data to the SSS factor structure originally proposed.[7] We will perform a test of measurement invariance (configural, metric, and scalar)[25] between the survivor and sibling groups.

CFA Model Fit. Following best practices,[26] statistical tests used to evaluate model fit for each measurement model will include change in chi-square (χ^2), the Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). We will interpret model fit according to standard cutoffs: χ^2 *p* value $\geq$ 0.05; TLI $\geq$ 0.95; RMSEA $\leq$ 0.05; SRMR $\leq$ 0.08.[27]

Model comparison for tests of measurement invariance. Comparisons between increasingly constrained measurement models for survivors and siblings (i.e., configural, metric, and scalar) will be interpreted holistically by evaluating significant change in χ^2, TLI, RMSEA, and SRMR. In the case of similar or not statistically different model fit between configural, metric, or scalar models, we will prefer the more parsimonious model (i.e., fewer paths freely estimated).[26] If the measurement model demonstrates adequate fit to the survivor and sibling data (either with or without invariance between samples), we will proceed to test Aims 2 (bivariate correlations) and 3 (moderated linear regression models) separately for survivors and siblings.

Next steps in the case of poor model fit. Should the SSS factor structure hypothesized *a priori* (see Figure 1) demonstrate **poor fit** to the CCSS data following the model fit cutoffs cited above, we will conduct an **exploratory factor analysis (EFA)** of all SSS items with significant variance to do so. This EFA will be tested in a subsample of 50% of survivors and 50% of participants, generated by splitting the sample based on best practices.[28] We will conduct EFAs separately for survivors and siblings. Based on general guidelines for structural equation modeling suggesting a minimum sample size of approximately 200, we anticipate that the half of the sample of 1658 female cancer survivors and 417 siblings (i.e., approximately 826 survivors and 208 siblings) will be sufficient for this analysis.[26]

The number of factors to be extracted from each EFA will be determined empirically based on best practices, including evaluation of eigenvalues, scree plot,[29] and interpretability of factors.[30]

a. Should the EFA-derived factor structure appear **similar** for survivors and siblings, we will proceed with a full CFA test of measurement invariance between survivors and siblings (i.e., configural, metric, and scalar, as above). This test will use the randomly selected 50% of the sample not included in the EFA. CFA-derived factors will subsequently be used for Aims 2 (bivariate correlations) and 3 (moderated linear regression models).

b. Should the EFA-derived factor structure appear to **differ** between survivors and siblings, we will proceed with a separate CFA for each group (using the randomly selected 50% of the sample not included in the EFA), in order to validate the factor structure extracted from the previous EFA – but we will *not* conduct a test of measurement invariance. CFA-derived factors will subsequently be used for Aims 2 (bivariate correlations; Figure 2) and 3 (moderated linear regression models; Figure 3).

Aim 2a: Explore direct correlations of each extracted SSS factor with demographic (e.g., race, education level), medical (e.g., reproductive cancer, medical comorbidities), sociocultural (e.g., religion, marital status), emotional (e.g., posttraumatic stress), and sexual function indices.

Bivariate correlations will be examined between extracted SSS factors and key sociodemographic (e.g., age at survey, race/ethnicity, education level), medical (e.g., age at diagnosis, reproductive cancer, treatment exposure known to impact sexual health, number of chronic health conditions), sociocultural (e.g., marital status, religion, history of pregnancy, infertility, and sexual activity), emotional (e.g., posttraumatic distress, depression/anxiety/somatization), and sexual function constructs. These analyses will be reported separately for survivors and siblings.

Aim 3a: Test a simple, *unadjusted* diathesis-stress model of SSS factors as moderators of sexual function - emotional distress linkage.

Moderated linear regression models will evaluate whether extracted SSS factors significantly moderate (i.e., enhance or attenuate, depending on valence of each extracted schema factor) the effects of sexual function on emotional distress indices such as posttraumatic stress, depression, anxiety, somatization, and emotional health-related quality of life. These analyses will be reported separately for survivors and siblings.

Aim 3b: Test an *adjusted* diathesis-stress model of SSS factors as moderators of sexual function - emotional distress linkage.

Moderated linear regression models will evaluate whether extracted SSS factors significantly moderate (i.e., enhance or attenuate, depending on valence of each extracted schema factor) the effects of sexual function on emotional distress indices such as posttraumatic stress, depression, anxiety, somatization, and emotional health-related quality of life *when adjusting for theoretical confounds of the direct correlation between sexual function and distress (i.e., age at cancer diagnosis, presence of cancer-related scarring/disfigurement, CTAE severity of chronic health conditions, pregnancy history, use of oral contraceptives/hormone replacement therapy)*. These analyses will be reported separately for survivors and siblings.

IMPLICATIONS AND FUTURE WORK

Following completion of Aims 1-3, this study will result in psychometric validation of a brief instrument to assess sexual self-schema among female survivors of childhood cancer and siblings. This tool will have important implications for future measure development efforts – for example, updating and refining SSS items to be relevant for recent cancer survivors endorsing gender or sexual minority identity-- a population in clear need of additional supportive care.[31] In addition, the brief tool validated by this study may be directly applied to the intervention development work that Dr. Finkelstein-Fox and her team are undertaking. Specifically, we may incorporate the extracted items into pre-post intervention surveys currently administered to women participating in her pilot trial of a novel sexual well-being program to determine the extent to which sexual self-schema are modifiable via brief behavioral intervention.

TABLES

Table 1. Descriptive statistics

Construct	**Variable**	**Group 1: Survivors *M (SD) or n (%)***		**Group 2: Siblings *M (SD) or n (%)***	
		Complete *N*	*M* (SD) *n* (%)	Complete *N*	*M* (SD) or *n* (%)
Sexual Schema (Primary)	Sexual Self-Schema Survey (SSS; Women's Health)				
Emotional Distress	SF-36 Health-Related Quality of Life (Women's Health)				
	Posttraumatic Stress Diagnostic Scale (PDS; FU 2)				
	Depression, Anxiety, Somatization (BSI-18; FU 2)				
Sexual Function	Sexual Function Questionnaire (SFQ; Women's Health)				
Demographic	Race (Baseline)				
	American Indian/Alaskan Native				
	Asian				
	Pacific Islander				
	Black				
	White				
	Other				
	Ethnicity (Baseline)				
	Hispanic				
	Non-Hispanic				
	Personal Income (Follow-Up 2)				
	<20,000				
	20,000-39,999				
	40-59,999				
	60-79,999				

	80-99,999				
	≥ 100,000				
	Health Insurance (Follow-Up 2)				
	Yes				
	No				
	Education level (Follow-Up 2)				
	1-8 years (grade school)				
	9-12 years (high school) but did not graduate				
	Completed high school/GED				
	Training after high school, other than college				
	Some college				
	College graduate				
	Post graduate level				
	Other				
	Employment (Follow-Up 2)				
	Yes				
	No				
	N/A				
	Age at survey (Women's Health)				
Medical	Age at diagnosis (Baseline)			--	--
	Cancer diagnosis (Baseline)			--	--
	Leukemia				
	CNS tumor				
	Osteosarcoma				
	Soft tissue sarcoma				
	Hodgkin lymphoma				
	Non-Hodgkin lymphoma				
	Wilms tumor				
	Neuroblastoma				
	Other				
	Cancer-related scarring/disfigurement			--	--
	Yes				
	No				
	Treatment exposures			--	--
	Pelvic Radiation				
	Cranial Radiation				
	Chemotherapy				
	Surgery to sexual organs (breast, pelvis)				
	Amputation				
	Hormonal treatment				
	Ovarian failure			--	--
	Yes				
	No				
	Use of oral contraceptives or hormone replacement therapy (Follow-Up 2)				
	Yes				
	No				

	Chronic health condition CTAE grade (Baseline)				
	Grade 1				
	Grade 2				
	Grade 3				
	Grade 4				
	Grade 5				
Sociocultural	Religion (Baseline)				
	None				
	Catholic				
	Lutheran				
	Baptist				
	Presbyterian				
	Episcopalian				
	Methodist				
	Other Protestant				
	Jewish				
	Other				
	Pregnancy history (Follow-Up 2)				
	Yes				
	No				
	Infertility history (Baseline)				
	Yes				
	No				
	Past-month sexual activity (Women's Health)				
	Yes				
	No				
	Marital status (Follow-Up 2)				
	Single				
	Married				
	Divorced				
	Other				
	Current sex partner (Women's Health)				
	Yes				
	No				
	Sexual experience/orientation (Women's Health)				
	Entirely heterosexual				
	Largely heterosexual, but some homosexual experience				
	Largely heterosexual, but considerable homosexual experience				
	Equally heterosexual and homosexual				
	Largely homosexual, but considerable heterosexual experience				

	Largely homosexual, but some heterosexual experience				
	Entirely homosexual				

Table 2a. Model Fit for CFA – Test of Measurement Invariance

Step	Model Type	*df*	χ^2	Δdf	$\Delta\chi^2$	p	TLI	RMSEA [90% CI]	SRMR
1	Configural – same factor structure								
2	Metric – same factor structure and loadings								
3	Scalar – same factor structure, loadings, and intercepts								

Notes. Df = degrees of freedom. P value refers to significance of change in χ^2 statistic from the model in the previous step.TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation ; SRMR = Standardized Root Mean Square Residual.

Table 2b. Standardized Factor Loadings for CFA

Item	Factor 1- Passionate/Romantic	Factor 2- Open/Direct	Factor 3- Embarrassed/Conservative
1. Uninhibited			
2. Cautious			
3. Loving			
4. Open-minded			
5. Timid			
6. Frank			
7. Stimulating			
8. Experienced			
9. Direct			
10. Broad-minded			
11. Arousable			
12. Self-conscious			
13. Straightforward			
14. Casual			
15. Prudent			
16. Embarrassed			
17. Outspoken			
18. Romantic			
19. Sympathetic			
20. Conservative			
21. Passionate			
22. Inexperienced			
23. Warm			
24. Unromantic			
25. Revealing			
26. Feeling			

Table 3a. Communalities for EFA, if indicated by poor model fit in CFA

Item	Communalities
1. Uninhibited	
2. Cautious	
3. Loving	
4. Open-minded	

5. Timid	
6. Frank	
7. Stimulating	
8. Experienced	
9. Direct	
10. Broad-minded	
11. Arousable	
12. Self-conscious	
13. Straightforward	
14. Casual	
15. Prudent	
16. Embarrassed	
17. Outspoken	
18. Romantic	
19. Sympathetic	
20. Conservative	
21. Passionate	
22. Inexperienced	
23. Warm	
24. Unromantic	
25. Revealing	
26. Feeling	

Table 3b. Pattern Factor Loadings for EFA, if indicated by poor model fit in CFA

Item	Factor 1- TBD*	Factor 2- TBD	Factor 3- TBD
1. Uninhibited			
2. Cautious			
3. Loving			
4. Open-minded			
5. Timid			
6. Frank			
7. Stimulating			
8. Experienced			
9. Direct			
10. Broad-minded			
11. Arousable			
12. Self-conscious			
13. Straightforward			
14. Casual			
15. Prudent			
16. Embarrassed			
17. Outspoken			
18. Romantic			
19. Sympathetic			
20. Conservative			
21. Passionate			
22. Inexperienced			
23. Warm			
24. Unromantic			
25. Revealing			
26. Feeling			

Notes: *Number of factors extracted will be determined empirically and may or may not be 3 factors as in the original published measure.

Table 4a. Bivariate correlations between SSS factors and key sociodemographic variables, reported separately for survivors and siblings

Variable	1	2	3	4	5	6	7
1. SSS Factor 1[#]							
2. SSS Factor 2							
3. SSS Factor 3							
4. Age at survey							
5. Race^							
6. Ethnicity (Hispanic)							
7. Education level							

Notes: [#]Number and theme of factors extracted will be determined empirically and may or may not be 3 factors as in the original published measure. ^Race will be coded as a categorical variable, as appropriate to the observed data (e.g., separate codes for Black/African-American compared to White, Asian/Pacific-Islander compared to White, American Indian/Alaska Native compared to White). ***p < .001, **p < .01, *p < .05

Table 4b. Bivariate correlations between SSS factors and key medical variables, reported separately for survivors and siblings

Variable	1	2	3	4	5	6	7
1. SSS Factor 1[#]							
2. SSS Factor 2							
3. SSS Factor 3							
4. Age at diagnosis							
5. Reproductive cancer (yes)							
6. Treatment exposure known to impact sexual health (yes)							
7. Severity grade of chronic health conditions							

Notes: [#]Number and theme of factors extracted will be determined empirically and may or may not be 3 factors as in the original published measure. ***p < .001, **p < .01, *p < .05

Table 4c. Bivariate correlations between SSS factors and key sociocultural variables, reported separately for survivors and siblings

Variable	1	2	3	4	5	6	7	8
1. SSS Factor 1[#]								
2. SSS Factor 2								
3. SSS Factor 3								
4. Marital status^								
5. Pregnancy history (yes)								
6. Infertility history (yes)								
7. Past-month sexual activity (yes)								
8. Religion[+]								
9. Current sex partner (yes)								
10. Sexual experience/orientation[+]								

Notes: [#]Number and theme of factors extracted will be determined empirically and may or may not be 3 factors as in the original published measure. ^Marital will be coded as a categorical variable, as appropriate to the observed data (e.g., separate codes for married compared to single, divorced compared to single). [+] Religion

and sexual orientation will be coded as categorical variables, as appropriate to the observed data. ***p < .001, **p < .01, *p < .05

Table 4d. Bivariate correlations between SSS factors and key emotional variables, reported separately for survivors and siblings

Variable	1	2	3	4	5	6	7	8
1. SSS Factor 1[#]								
2. SSS Factor 2								
3. SSS Factor 3								
4. Health-Related QOL								
5. Posttraumatic Stress								
6. Depression								
7. Anxiety								
8. Somatization								

Notes: [#]Number and theme of factors extracted will be determined empirically and may or may not be 3 factors as in the original published measure. ***p < .001, **p < .01, *p < .05

Table 4e. Bivariate correlations between SSS factors and sexual function, reported separately for survivors and siblings

Variable	1	2	3	4
1. SSS Factor 1[#]				
2. SSS Factor 2				
3. SSS Factor 3				
4. Sexual Function				

Notes: [#]Number and theme of factors extracted will be determined empirically and may or may not be 3 factors as in the original published measure. ***p < .001, **p < .01, *p < .05

Table 5a. Moderated linear regression models, reported separately for survivors and siblings

	Model 1 (Main Effects Only)			Model 2 (Interaction)		
	B	SE	β	B	SE	β
Posttraumatic Stress						
SSS Factor 1						
SSS Factor 2						
SSS Factor 3						
Sexual Function						
SSS F1 X Sexual Function	--	--	--			
SSS F2 X Sexual Function	--	--	--			
SSS F3 X Sexual Function	--	--	--			
R^2						
ΔR^2	--	--	--			
F						
Depression						
SSS Factor 1						
SSS Factor 2						
SSS Factor 3						
Sexual Function						

SSS F1 X Sexual Function	--	--	--			
SSS F2 X Sexual Function	--	--	--			
SSS F3 X Sexual Function	--	--	--			
R^2						
ΔR^2						
F						
Anxiety						
SSS Factor 1						
SSS Factor 2						
SSS Factor 3						
Sexual Function						
SSS F1 X Sexual Function	--	--	--			
SSS F2 X Sexual Function	--	--	--			
SSS F3 X Sexual Function	--	--	--			
R^2						
ΔR^2	--	--	--			
F						
Somatization						
SSS Factor 1						
SSS Factor 2						
SSS Factor 3						
Sexual Function						
SSS F1 X Sexual Function	--	--	--			
SSS F2 X Sexual Function	--	--	--			
SSS F3 X Sexual Function	--	--	--			
R^2						
ΔR^2	--	--	--			
F						
Health-Related QoL						
SSS Factor 1						
SSS Factor 2						
SSS Factor 3						
Sexual Function						

SSS F1 X Sexual Function	--	--	--			
SSS F2 X Sexual Function	--	--	--			
SSS F3 X Sexual Function	--	--	--			
R^2						
ΔR^2	--	--	--			
F						

Notes: #Number and theme of factors extracted will be determined empirically and may or may not be 3 factors as in the original published measure. QoL = Quality of Life. ***p < .001, **p < .01, *p < .05

Table 5b. Moderated linear regression models, reported separately for survivors and siblings

	Model 1 (Main Effects Only)			Model 2 (Interaction)		
	B	SE	β	B	SE	β
Posttraumatic Stress						
Age at Cancer Diagnosis						
Presence of Scarring/Disfigurement (yes)						
CTAE Severity						
Pregnancy History (yes)						
Ovarian Failure (yes)						
Oral Contraceptives/Hormone Replacement Therapy (yes)						
SSS Factor 1						
SSS Factor 2						
SSS Factor 3						
Sexual Function						
SSS F1 X Sexual Function	--	--	--			
SSS F2 X Sexual Function	--	--	--			
SSS F3 X Sexual Function	--	--	--			
R^2						
ΔR^2	--	--	--			
F						
Depression						
Age at Cancer Diagnosis						
Presence of Scarring/Disfigurement (yes)						
CTAE Severity						
Pregnancy history (yes)						
Ovarian failure (yes)						
Oral Contraceptives/Hormone Replacement Therapy (yes)						
SSS Factor 1						
SSS Factor 2						
SSS Factor 3						
Sexual Function						
SSS F1 X Sexual Function	--	--	--			

SSS F2 X Sexual Function	--	--	--			
SSS F3 X Sexual Function	--	--	--			
R^2						
ΔR^2						
F						
Anxiety						
Age at Cancer Diagnosis						
Presence of Scarring/Disfigurement (yes)						
CTAE Severity						
Pregnancy history (yes)						
Ovarian failure (yes)						
Oral Contraceptives/Hormone Replacement Therapy (yes)						
SSS Factor 1						
SSS Factor 2						
SSS Factor 3						
Sexual Function						
SSS F1 X Sexual Function	--	--	--			
SSS F2 X Sexual Function	--	--	--			
SSS F3 X Sexual Function	--	--	--			
R^2						
ΔR^2	--	--	--			
F						
Somatization						
Age at Cancer Diagnosis						
Presence of Scarring/Disfigurement (yes)						
CTAE Severity						
Pregnancy history (yes)						
Ovarian failure (yes)						
Oral Contraceptives/Hormone Replacement Therapy (yes)						
SSS Factor 1						
SSS Factor 2						
SSS Factor 3						
Sexual Function						
SSS F1 X Sexual Function	--	--	--			
SSS F2 X Sexual Function	--	--	--			
SSS F3 X Sexual Function	--	--	--			
R^2						
ΔR^2	--	--	--			
F						
Health-Related QoL						
Age at Cancer Diagnosis						
Presence of Scarring/Disfigurement (yes)						
CTAE Severity						
Pregnancy history (yes)						

Ovarian failure (yes)						
Oral Contraceptives/Hormone Replacement Therapy (yes)						
SSS Factor 1						
SSS Factor 2						
SSS Factor 3						
Sexual Function						
SSS F1 X Sexual Function	--	--	--			
SSS F2 X Sexual Function	--	--	--			
SSS F3 X Sexual Function	--	--	--			
R^2						
ΔR^2	--	--	--			
F						

Notes: #Number and theme of factors extracted will be determined empirically and may or may not be 3 factors as in the original published measure. QoL = Quality of Life. ***p < .001, **p < .01, *p < .05

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