

Running Head: Shame Related to HIV Infection

The Development and Psychometric Properties of the HIV and Abuse Related  
Shame Inventory (HARSI)

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**Acknowledgements**

This research was supported by grants R01-MH62965, K23-MH076671, and P30-MH62294 (Center for Interdisciplinary Research on AIDS; CIRA) from the National Institute of Mental Health. The authors gratefully acknowledge our community collaboration with Callen-Lorde Community Health Center in New York City.

**Author Disclosure Statement**

No competing financial interests exist.

**Abstract**

Shame has been shown to predict sexual HIV transmission risk behavior, medication non-adherence, symptomatic HIV or AIDS, and symptoms of depression and PTSD. However, there remains a dearth of tools to measure the specific constructs of HIV- and sexual abuse-related shame. To ameliorate this gap, we present a 31-item measure which assesses HIV and sexual abuse-related shame, and the impact of shame on HIV-related health behaviors. A diverse sample of 271 HIV-positive men and women who were sexually abused as children completed the HIV and Abuse Related Shame Inventory (HARSI) among other measures. An exploratory factor analysis supported the retention of three-factors, explaining 56.7% of the sample variance. These internally consistent factors showed good test-retest reliability, and sound convergent and divergent validity using eight well-established HIV specific and general psychosocial criterion measures. Unlike stigma or discrimination, shame is potentially alterable through individually-focused interventions, making the measurement of shame clinically meaningful.

**Keywords:** HIV-related shame, abuse-related shame, exploratory factor analysis, childhood sexual abuse, HIV/AIDS

## Introduction

Approximately 1.1 million people in the United States are living with HIV/AIDS [1, 2]. As many as 33% to 53% of these individuals have also experienced childhood sexual abuse CSA [3-6], rates at least double those observed in the general population [7-10]. Individuals living with both HIV and a history of CSA face diverse challenges, including high rates of mental health problems such as Posttraumatic Stress Disorder (PTSD), depression, anxiety, and Borderline Personality Disorder; substance use problems; adult revictimization; homelessness and incarceration [4, 11, 12]. Further, people living with HIV who have a history of CSA demonstrate higher rates of HIV transmission risk behavior such as unprotected sex with HIV-negative or serostatus unknown partners [13, 14] and exchanging sex for money, drugs, or shelter [15] over those who do not have such a history.

People living with HIV and people who have experienced CSA have each separately been noted as being at risk for experiencing shame [16-19]. Shame is a painful emotion resulting from negative self-evaluation following a perceived deviation from a social or moral code [20-22], and is accompanied by feelings of worthlessness, rejection, isolation, and the desire to disappear. The globalized sense of self-inferiority experienced in shame is thought to make individuals more prone to psychological maladjustment than other emotions [21, 22]. In fact, shame has been shown to have negative impacts on behavioral, physical, clinical, and psychosocial outcomes [19, 21, 22]. HIV-related shame has been shown to be a predictor of sexual HIV transmission risk behavior [23], HIV medication non-adherence [24], reduced health-related quality of life [19], as well as non-attendance in clinical trials [25]. Similarly, sexual abuse-related shame has been related to greater depression and PTSD symptoms and decreased self-esteem [17, 18], adult revictimization [26, 27], dissociation [28], and greater

verbal and physical intimate partner and family conflict [29]. Finally, those with higher levels of CSA-related shame were less likely to improve in group therapy [30].

Despite this body of work, the measurement of HIV- and CSA-related shame is still nascent. Rather than evaluating HIV-related shame as a unique factor, HIV-related shame is often included as a component of HIV-related stigma or with other related but distinct constructs such as blame, judgment, or social isolation [31, 32]. While shame and internalized stigma are sometimes considered equivalent, we consider them to be related but distinct concepts. Stigma involves the experience of blame, exclusion, or rejection due to another's negative social judgment [33], and thus is a socially-constructed concept derived from culturally embedded power structures to mark a perceived defect or disgrace, making stigma resistant to change [34-36]. On the other hand, shame is an internally-constructed emotional response which may be influenced, but not controlled, by stigmatizing attitudes perceived to be present in the community or internalized by the individual [19]. A consequence of this conceptualization is that shame, unlike stigma and discrimination, is more amenable to change through psychosocial interventions [21, 37]. Indeed, research supports this view of shame and stigma as related but separate constructs [37-39].

We are only aware of one measure which separately assesses HIV-related shame – a three-item subscale from a measure of HIV-related stigma, which has not been tested for reliability or validity, and contains only a marginally acceptable number of items to be considered for factor analysis [40]. In the CSA literature, many studies have used generalized measures of shame instead of abuse-specific shame [26, 28, 29]. However, this is problematic as correlations between abuse specific shame and general shame are low [16], and measures of general shame have been shown to have diminished validity in clinical samples [41]. We are

aware of only 2 measures of CSA-related shame – a four-item measure for children [17, 18], and the 18-item Abuse-Related Beliefs Questionnaire (ARBQ) [42], which contains subscales measuring Guilt, Shame, and Resilience, but has only been tested on women. Further, despite the high prevalence of CSA among those living with HIV, and the negative impact of shame resulting from each, to our knowledge there are no measures which a) assess HIV-related and CSA-related shame concurrently; b) directly ask individuals how shame might impact behaviors such as HIV transmission risk behavior, medication non-adherence, or serostatus disclosure; or c) assess how HIV-related shame might affect shame experienced due to membership in another marginalized group, such as being gay, engaging in sex work, or using intravenous drugs.

There is a clear need for more extensive measurement of shame specific to HIV infection and to CSA. Therefore, the purpose of this study is to describe the development of a measure of shame regarding sexual abuse and HIV infection, including evaluating the factor structure and establishing the reliability and validity of HIV and Abuse Related Shame Inventory (HARSI). The development of the HARSI was influenced by shame-based PTSD [43], which describes shame as both a primary and secondary emotion. Shame as a primary emotion results from the perceived loss of social value and serves as a mechanism for maintaining social rank and order, leads to submissive behaviors and reinforces perceptions of the self as damaged. Shame as a secondary emotion results from a cognitive appraisal of oneself as being weak or acting contrary to social values, and can lead to intrusive and negative thoughts and avoidant behavior. Feelings of shame can influence avoidant behaviors, withdrawal from social networks, negative self-image, reduced self-care and increased health risk behavior, and is therefore a critical variable to understand among people living with HIV. While the HARSI was not designed to differentiate between primary and secondary shame, it was designed to bridge the gaps noted in the literature

above by: a) assessing both HIV-related and CSA-related shame, allowing for relative comparison of the two specific types of shame in populations which are dually impacted; b) reflecting multiple aspects of shame, such as rejection, self-reproach, and the desire to withdraw; c) assessing the impact of shame on HIV-related health behaviors (e.g., disclosure, medication adherence, treatment utilization); and d) assessing the effect of concurrent sources of shame.

## **Methods**

### *Participants*

As part of a randomized controlled trial for a group intervention for coping with HIV and CSA [11, 14], HIV-positive adults (age 18 or older) who had experienced sexual abuse as a child and/or adolescent were recruited between March 2002 and January 2004 from community organizations and health care clinics serving those with HIV/AIDS in New York City. Flyers and printed recruitment material advertised a group intervention for people living with HIV who had experienced CSA. Participants were included in the study if they had experienced sexual abuse as a child (age 12 years and under) and/or adolescent (age 13 to 17 years), defined as any unwanted touching of a sexual nature by an adult or by someone at least 5 years older than the participant when the incident occurred. Participants were excluded if they presented with impaired mental status or active psychosis. Further, to prevent participants in need of immediate care from being randomly assigned to a waitlist condition in the larger trial, those with acute distress due to sexual revictimization within the past month or severe depressive symptoms (Beck Depression Inventory [BDI] score > 30) [44] were also excluded. All participants provided informed consent and procedures were approved by an institutional review board.

Of the 333 potential participants that were screened for eligibility, 21 did not meet the aforementioned criteria (7 had not been sexually abused, 1 had experienced sexual

revictimization in the past month, 6 were cognitively impaired, and 7 were severely depressed) and 41 participants were not enrolled in the study for assorted reasons (23 could not be located following screening, 13 were unable to continue, 3 were incarcerated, and 2 died). Two hundred and seventy-one individuals (137 male, 130 female, 4 transgendered) were eligible for the study and returned to complete the baseline assessment. For all analyses, the four transgendered participants were categorized according to their self-identification (3 female, 1 male). Participants were diverse based on sexual orientation (men, 75.4% gay/homosexual; women, 75.6% heterosexual) and ethnicity (68% African American, 17% Hispanic/Latino, 10% Caucasian, and 5% other), and had experienced high levels of stress and trauma in their lifetimes. The level of sexual abuse was severe: 90% had experienced penetrative anal or vaginal abuse prior to the age of 18, 58% were sexually abused during both childhood and adolescence, and 55% were sexually revictimized as adults. Additionally, 38% of study participants met DSM-IV diagnostic criteria for posttraumatic stress disorder (PTSD), 64% of participants had been homeless, 42% had been incarcerated, and 49% had traded sex for money or drugs.

### *Procedures*

All interested participants were screened for sexual abuse history using a structured clinical interview based on a modified and expanded version of the Traumatic Experiences Questionnaire [45]. Eligible participants returned to complete a baseline assessment using a computer assisted personal interview, after which they were randomly assigned to one of three conditions: the HIV and trauma coping group intervention, a time-matched support group intervention, or a waitlist control condition. Both groups provided a supportive environment for participants to address issues of HIV and trauma [46]. Participants randomly assigned to the waitlist control condition were subsequently re-administered the baseline assessment and then



randomly assigned to one of the two treatment conditions after four months. Thus, all study participants were ultimately randomly assigned one of the two active treatment conditions. Any participant who experienced an extreme level of distress, including suicidal intention, was referred for evaluation and additional services. Post assessments were administered using a computer assisted personal interview within two weeks following completion of the group interventions. Participants received \$35 for completion of the baseline assessment and \$45 for completion of the post assessment

### *Shame Measure*

*HIV and Abuse Related Shame Inventory (HARSI)*. Based on existing literature linking shame with traumatic stress [43, 47], we developed a conceptual model of the construct of shame, and, with the goal of developing a brief measure, identified components of shame relevant to both HIV infection and CSA. These include: difficulties with disclosure; decreased social standing and rejection; self-reproach; believing one deserves to be mistreated; a desire to hide or disappear; and feelings of defect, worthlessness, and shame. Additionally, we wanted to identify the impact of shame on HIV-specific health behaviors. Again, based on existing literature, we identified four key components of health behavior that may be particularly impacted by shame: HIV risk behavior, healthcare and service utilization, HIV serostatus disclosure, and interacting with others. Finally, items were created to assess how individuals might feel shame as a result of being HIV-positive in conjunction with membership in another marginalized group, including: being gay, having been sexually abused, being a drug user, or engaging in transactional sex.

We created 47 items to assess shame related to HIV infection and shame related to sexual abuse which were divided into four scales: (A) HIV-Related Shame, (B) Impact of HIV-Related

Shame on Behavior, (C) Sexual Abuse-Related Shame, and (D) Shame Interaction Effects. Note that Scales A (HIV-Related Shame) and B (Impact of Shame on Behavior) were thought of as general scales that could have applicability across a range of groups living with HIV, while Scale C (Sexual Abuse-Related Shame) was considered a more focused measure to compare and differentiate shame related to sexual abuse from shame related to living with HIV.

The original 47 items were pilot tested with 39 people living with HIV who had experienced CSA. Based on Cronbach's alphas and item-total correlations, we eliminated four items from the HIV-Related Shame scale (Scale A). All four of these items were reverse coded, leaving one reverse coded item in the final version of this scale. We also rewrote one item on the HIV-Related Shame scale to make its intention clearer. Changes made to the Impact of HIV-Related Shame on Behavior scale (Scale B) included eliminating one item that referred to using a needle exchange that had low frequency of endorsement, merging two pairs of items with similar content that showed response patterns suggesting redundancy, and rewriting two other items to make their intention clearer. Finally, we eliminated two reverse coded items from the Sexual Abuse-Related Shame scale based on reliability data.

Abbreviated versions of the 38 HARSI items included in this study are listed by scale on Table 1; full items are available from the authors. For each item, participants were asked to indicate how true each statement was for them during the past month on a 5-point Likert scale (0 = *not at all*, 1 = *a little bit*, 2 = *somewhat*, 3 = *quite a bit*, 4 = *very much*).

#### *Measures for convergent and divergent validity*

As shame has been associated with symptomatic HIV or AIDS [40], HIV transmission risk behavior [23], and psychological distress [48], the following measures were used to estimate convergent and divergent validity.

*HIV Physical Symptoms [49]*. HIV physical symptoms were assessed over a four month retrospective period using a 20-item self report measure. Participants were asked to rate the severity of 12 symptoms found in HIV disease and eight more general symptoms using a 5-point Likert scale (0 = *not present*, 1 = *mild*, 2 = *moderate*, 3 = *severe*, 4 = *very severe*). Items are summed to generate a total score, with higher scores reflecting more severe symptom severity. This scale exhibited strong internal consistency with the current sample (Chronbach's alpha = 0.93).

*HIV-Related Stressors [50]*. This 13-item measure was used to measure HIV-specific stressors (e.g. AIDS discrimination, drug regimen, HIV illness of friends or relatives). Respondents rated how often they felt stressed by each of these items during the past four months on a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*always*). A total score was calculated by summing the score for each item. In the current sample the internal consistency for this measure was good (Cronbach's alpha = 0.89).

*Sexual HIV Transmission Risk Behavior [23]*. Participants reported the number of times they engaged in oral, anal, and vaginal intercourse with and without condoms in the past four months. They also reported the HIV status of each partner with whom they engaged in each behavior in the previous four months. As sexual behavior data formed highly skewed and zero-inflated distributions, dichotomous coding was used to categorize participant responses into a dichotomous variable representing sexual HIV transmission risk behavior. This variable was coded affirmatively if the participant had engaged in any unprotected anal or vaginal sexual behavior with a HIV-negative or serostatus unknown partner in the previous four months.

*Traumatic Symptom Inventory(TSI) [51]*. The TSI is a 100-item self-report measure that assesses acute and chronic posttraumatic symptoms. Each item reflects a potential trauma

symptom and was rated according to its frequency of occurrence over the preceding six months on a 4-point Likert scale (0 = *never*, 3 = *often*). The TSI consists of 10 clinical scales that can be categorized into three broad symptom clusters labeled: *trauma-related symptoms*, *mood and anxiety symptoms*, and *behavioral difficulties*. The *trauma-related symptoms* cluster assesses trauma-specific symptom domains and contains the following four scales: Intrusive Experiences, Defensive Avoidance, Dissociation, and Impaired Self-Reference. The *mood and anxiety symptoms* cluster assesses symptom domains that are frequently associated with trauma and contains the following three scales: Anger/Irritability, Depression, and Anxious Arousal. The *behavioral difficulties* cluster assesses common behavioral disruptions that are associated with trauma, particularly sexual trauma, and contains the following three scales: Sexual Concerns, Dysfunctional Sexual Behavior, and Tension Reduction Behavior. The clinical scales of the TSI are internally consistent (Cronbach's alphas = 0.81 to 0.91, current sample).

*Symptom Checklist 90—Revised (SCL-90-R) [52]*. The SCL-90-R has been used extensively to assess both global psychiatric distress and specific types of distress symptoms. Participants are asked to rate how much they were distressed by each of 90 psychiatric symptoms on a 5-point Likert scale over the past seven days (0 = *not at all*, 4 = *extremely*). The mean score across the 90-items produces a Global Severity Index (Cronbach's alpha = 0.98, current sample).

*Perceived Availability of Social Support (PASS) [53]*. Perceived availability of social support (PASS) was measured using a subscale (7 items) of the Social Relationship Scale. The PASS assesses whether an individual believes he or she would have support from others given various situations, such as inability to get out of bed for several weeks. Responses are given on a 5-point Likert scale, ranging from 1 (*definitely no*) to 5 (*definitely yes*). Good internal consistency was observed in the current sample (Cronbach's alpha = 0.85).

To evaluate convergent and divergent validity, Pearson correlations between each Shame scale and each validity measure at baseline were computed, except for Sexual HIV Transmission Risk Behavior, where a Spearman-Brown correlation was computed instead. It was hypothesized that the Shame scales would be positively correlated with HIV-Specific Measures, with HIV-Related Shame having the strongest relationships with these variables, except for Sexual HIV Transmission Risk Behavior, which would have the strongest relationship with Impact of HIV-Related Shame on Behavior. It was also hypothesized that Shame scales would be positively correlated with all of the Psychosocial measures except Perceived Availability of Social Support, which would be negatively related to Shame. Further, it was hypothesized that Sexual Abuse-related Shame would have the strongest correlations with Psychosocial Measures.

### *Statistical Analysis*

*Exploratory factor analysis (EFA).* Factor analysis was confined to EFA, as the sample size restricted us from splitting the data into validation and confirmatory samples [54], as is ideal. To validate our constructs, EFA was performed in Mplus version 5.21 [55] using the robust WLS mean- and variance-adjusted  $\chi^2$  test (WLSMV), which has been shown to have good statistical properties in testing model fit with relatively small sample sizes ( $N = 200$ ) and ordinal outcomes [56, 57]. Additionally, full-information maximum likelihood estimation was chosen to account for data missing at random, also minimizing parameter biases [58]. An oblique quartimin rotation was performed, allowing extracted factors to correlate [59], as was our expectation. To determine the number of factors to retain in the solution, Glorfeld's [60] extension of Horn's parallel analysis [61] was used – one of the most accurate methods available. Glorfeld's extension of parallel analysis compares the eigenvalues of extracted factors to eigenvalues generated using a Monte Carlo simulation, with factors having eigenvalues larger

than expected by chance retained. Thus, components were kept when their eigenvalues were larger than those from the 95th percentile in multiple simulations using random data. Finally, we considered several other important item-level features to increase interpretability of the factors, including: (a) amount of missing data, as some questions were not applicable to the full sample; (b) residual variances (i.e., no high negative values) [62]; and (c) factor loadings exceeding the critical cutoff of 0.4, [54] with minimal cross-loadings. After an initial EFA, results were evaluated and poorly performing items were removed. A subsequent EFA with the remaining items was then performed.

*Reliability and Validity.* Cronbach's alpha coefficients were calculated to assess internal consistency. Test-retest reliability over a four month period was assessed using data from a non-treated group from the larger trial. This group was comprised of 48 participants randomized to the waitlist control condition who completed both baseline and post assessments, and 18 individuals who were unable to start group therapy due to scheduling difficulties and who were later re-administered the baseline assessment prior to starting a subsequent group, for a total of 66 participants. Convergent and divergent validity was assessed using the measures described above. Finally, *t*-tests comparing mean differences of Shame Scales by gender found no significant differences (*t*-values ranged from 0.21 to 1.69, with *p* values all greater than .05). These calculations were performed on the final subscales using SPSS 14.0.

## **Results**

### *Exploratory factor analysis*

An initial parallel analysis with all 38 original shame items supported the retention of four factors, conforming to our theoretical expectations (see Table 1 for factor loadings). Thus, an initial EFA was performed retaining four factors. Applying our item-level criteria as described

above, the following items were dropped prior to repeating the analysis: (a) items B2, B7, D1, and D3-5 due to substantial missing data (>18%); (b) item B2 due to a high residual variance and cross-loading; and (c) item A13 due to a poor factor loading.

With this reduced set of 31 items, a parallel analysis suggested the retention of three-factors (see Table 2 for factor loadings). This final model explained 56.7% of the sample variance, however, because factors were correlated, the amount of unique variance accounted for by individual factors was not examined. Only three items loaded contrary to our theoretically-derived subscales, with A12 (“I feel I deserve to be mistreated by others because of my HIV”) loading on the Impact of Shame on Behavior subscale instead of the HIV-Related Shame subscale, item B5 (“Feelings of shame that I’m HIV+ have kept me from telling my HIV status to a friend or family member”) loading on the HIV-Related Shame subscale instead of the Impact of Shame on Behavior subscale, and item D2 (“Shame I feel about being sexually abused or raped makes me more ashamed about being HIV+”) loading on the Sexual Abuse-Related Shame subscale instead of the Shame Interaction Effects subscale. In fact, the Shame Interactions Effects subscale was eliminated due to the removal of four of the five original items because of substantial missing data due to participants not endorsing being gay, a drug user or a sex worker. The three remaining subscales, HIV-Related Shame, the Impact of Shame on Behavior, and Sexual Abuse-Related Shame were retained and assessed for internal consistency, temporal stability, and convergent and divergent validity.

### *Reliability and Validity*

Items for each of the three scales suggested by the EFA were further evaluated for internal consistency. Both item-scale total correlations, Cronbach’s alpha for the scale with each item removed, and overall Cronbach’s alpha were evaluated and supported the final solution of

the EFA. Scale items were then summed to form total scale scores for each of the three scales, and test-retest reliability was evaluated by computing Pearson correlations for each scale at baseline with scores on each scale four months later in the sample of participants who were not exposed to a group intervention during the four month wait period. For internal consistency and test-retest reliability, Cronbach's alphas and Pearson correlations are respectively listed on the bottom rows of Table 2.

Table 3 presents descriptive data for each of the final Shame subscales, and for each of the validity measures examined in this study. Correlations demonstrating convergent and divergent validity are shown in Table 4. For the most part, correlations followed our hypothesized patterns as outlined on p. 11. However, only the Impact of HIV-Related Shame on Behavior was correlated with Sexual HIV Transmission Risk Behavior. While all three Shame scales were significantly related to HIV Physical Symptoms, Sexual Abuse-Related Shame actually had the strongest relationship. Finally, while all of the Shame scales were negatively associated with Perceived Availability of Social Support, the Impact of HIV-Related Shame on Behavior had the strongest relationship with this variable.

## **Discussion**

While the negative consequences of stigma on people living with HIV have been recognized [34], the role of shame has received much less attention. Research suggests, however, that shame does have negative consequences on mental and physical health [21], has been directly linked to PTSD [43, 47], and results in avoidance that may impact HIV health behaviors such as disclosure and health care utilization. Further, among people living with HIV, shame may be related to several factors, including living with HIV and the experience of CSA. Thus we created the HARSII to measure components of shame relevant to both HIV infection and CSA,



including the impact of shame on HIV-specific health behaviors.

The HARSII consists of three internally-consistent subscales: HIV-Related Shame, the Impact of Shame on Behavior, and Sexual Abuse-Related Shame. The measure was developed for and tested in a highly traumatized population of people living with HIV infection who had experienced sexual abuse as children or adolescents. The sample was diverse across gender, sexual orientation, ethnicity, and socio-economic status. The results of the exploratory factor analysis presented here and the moderate correlations observed between subscales support the inclusion of three subscales in a single measure. Four month test-retest reliability was good for the HIV- and Sexual Abuse-Related Shame subscales. While test-retest reliability was low for the Impact of Shame on Behavior subscale, this is understandable given that many of the behaviors on this subscale may be impacted by opportunity (such as the presence of a sex partner or interaction with family members), or need for services and information, which may change over time.

The HARSII demonstrated sound convergent and divergent validity using eight well-established HIV-specific and broader psychosocial criterion measures. As desired, correlations were moderate (.5) at best, indicating the HARSII is measuring related but distinct constructs. While most measures performed as hypothesized, deviations occurred in three areas: (1) Only the Impact of Shame on Behavior Scale was correlated with Sexual HIV Transmission Risk Behavior. This does make sense as the HIV- and Sexual Abuse related Shame Scales focus more on emotions while the Impact of Shame on Behavior Scale focuses on behavior. However, the relationship between HIV-Related Shame and Sexual HIV Transmission Risk did trend toward significance. Further, there were instances of unprotected sex occurring within serodiscordant couples where shame is likely not a factor, which dilutes the relationship between shame and

risk. Finally, we would anticipate that HIV and Sexual Abuse Related Shame would more strongly impact serostatus disclosure; however, we did not assess disclosure in relation to unprotected sex in this study. (2) While all three Shame scales were significantly related to HIV Physical Symptoms, surprisingly Sexual Abuse-Related Shame had the strongest relationship with this variable, although the difference was marginal. However, to some degree this may reflect the negative health consequences of traumatic stress [63]. (3) Finally, the Impact of Shame on Behavior Scale had the strongest relationship with Perceived Availability of Social Support. This is understandable given that this subscale contains several items on social interaction.

The HARSIS items generally formed distinct factors as expected, with the following exceptions: Seven of the initial items were dropped from the measure, six which pertained to illicit drugs, sex work, and being gay, and one due to poor factor loading. Only 43.1% of our sample identified as being gay or lesbian; in the past 4 months, only 3.3% had engaged in injection drug use (43.5% any illicit drug use); and 12.2% had engaged in sex work. Thus, in the future, it would be beneficial to assess these items using samples specifically drawn from these groups. The final item to be dropped was the sole positively-worded item (“I accept myself as an HIV+ person”) due to poor factor loading. While more positively-worded items in the measure would have been beneficial, it is not clear that self-acceptance is the opposite of shame such that the item could be reverse scored and included in a scale with items reflecting shame. Indeed, other measures of shame are comprised entirely of negatively-worded items [16, 37, 40, 64, 65]. In the final analysis, there were just two cross-loadings: items A12 and B5, which loaded instead on the Impact of Shame on Behavior and the HIV-Related Shame subscale, respectively. Future

work should assess the fit of these items to determine whether this is purely a sample-specific artifact.

The HARSIS was developed using a very specialized population, adults living with HIV infection who experienced CSA. While we anticipate Scales A and B will have utility for measuring HIV-Related Shame and the Impact of Shame on Behavior among broader samples of people living with HIV, this was not tested in the current study. Additionally, while we measured the impact of HIV-related Shame on HIV health behaviors, we did not ask about the impact of Abuse-related Shame on behavior. Further, we did not have a sufficient sample size to confirm the results of exploratory factor analyses. Future work with larger sample sizes could confirm the robustness of the factors by performing a confirmatory factor analysis, and if possible, separately looking at the effects of factors such as gender and sexual orientation. Previous work has shown that women are more prone to feel shame than men [66], HIV-related shame has been associated with female gender [40], and CSA-Related Shame has been found to be greater in girls at abuse discovery (but not a year following the abuse) [18]. However, our results do not indicate that separate analysis by gender would significantly change the factor structure of the HARSIS, and there are no differences in level of shame by gender or sexual orientation. Additionally, by making HARSIS scales A and C parallel rather than specific, we can compare the relative impact of shame resulting from HIV or CSA, but we may be missing some important phenomenological aspects of shame specific to living with HIV or experiencing sexual abuse. A final limitation is that the current study did not include an established criterion measure of shame, such as the Abuse-Related Beliefs Questionnaire (ARBQ). While our measure has good reliability, face validity, and evidence for construct (convergent and divergent) validity, comparison with an established criterion is desirable.

Given the high prevalence of CSA among those living with HIV and the documented negative impact of shame on behavioral, physical, clinical, and psychosocial outcomes, there is a great need for reliable and valid measurement instruments to assess shame. Thus the HARSI adds substantially to the current literature, which is surprisingly lacking in robust measures specific to HIV- and CSA-related shame. The HARSI is the only measure we are aware of that (1) addresses both HIV- and sexual abuse-related shame concurrently, (2) captures multiple emotional and behavioral components of shame, and (3) includes a subscale assessing the impact of shame on behaviors such as healthcare service utilization, risk behavior, medication non-adherence, and serostatus disclosure, all of which have been influenced by shame [24, 40]. In fact, this measure has already been used to demonstrate the negative impact of shame on sexual HIV transmission risk behavior [23] and on health related quality of life [19]. Additionally, unlike stigma and discrimination, shame is a potentially modifiable variable at the individual level, and has been shown to be responsive to therapy [48, 67]. Finally, shame may prevent patients from fully disclosing their symptoms, resulting in poorer treatment outcomes [30, 68]. Thus addressing patient shame may be critical in overcoming barriers to care and achieving optimal physical and mental health outcomes.

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Table 1: Quartimin rotated factor loadings and percent missing data for four factor solution of full measure

	Factor				% data missing
	1	2	3	4	
<b>Scale A: HIV-Related Shame</b>					
A1: Hard To Tell People About My Infection	<b>0.812</b>	0.076	-0.080	-0.335	0%
A2: Failed To Live Up To My Expectations	<b>0.684</b>	-0.020	0.029	-0.042	0%
A3: Expect People To Think Less Of Me	<b>0.750</b>	-0.068	0.157	-0.051	0.4%
A4: Put Myself Down For Having HIV	<b>0.708</b>	-0.016	0.207	0.167	0%
A5: Feel Defective Cause Of HIV	<b>0.792</b>	-0.108	0.085	0.258	0%
A6: Ashamed HIV+	<b>0.835</b>	-0.042	0.082	0.148	0.4%
A7: Expect Rejection When Others Find Out	<b>0.758</b>	-0.121	0.175	0.084	0.4%
A8: Feel Worthless Because HIV	<b>0.659</b>	-0.001	0.211	0.232	0%
A9: Ashamed By HIV Symptoms	<b>0.682</b>	0.019	0.102	0.230	0.4%
A10: Hide Infection From Others	<b>0.824</b>	0.199	-0.067	-0.116	0%
A11: Dread Others Will Find Out HIV Status	<b>0.741</b>	0.152	-0.050	0.087	0%
A12: Deserve To Be Mistreated	0.210	<b>0.559</b>	0.182	-0.068	0%
A13R: I Accept Myself As An HIV+ Person	0.190	0.137	0.137	-0.071	0.4%
A14: HIV Makes Me Want To Disappear	<b>0.518</b>	0.143	0.231	0.144	0%
<b>Scale B: Impact of HIV-Related Shame on Behavior</b>					
B1: Kept Me Using Condom	0.233	<b>0.572</b>	-0.119	0.023	7.7%
B2: Kept Me From Cleaning Needles	-0.292	<b>0.866</b>	-0.078	0.247	<b>30.6%</b>
B3: Kept Me From Interacting With Others	0.279	<b>0.590</b>	-0.092	-0.005	2.2%

B4: Kept Me From Applying For Services	0.202	<b>0.641</b>	0.143	-0.057	0.7%
B5: Kept Me From Telling Status to Family	<b>0.618</b>	0.316	-0.111	-0.135	1.1%
B6: Kept Me From Telling Status To Sex Partner	0.396	<b>0.567</b>	-0.169	-0.006	7.4%
B7: Kept Me From Telling Status To Drug Partner	0.003	<b>0.846</b>	0.045	0.207	<b>34.7%</b>
B8: Delayed Me From Getting Healthcare	0.202	<b>0.611</b>	0.159	0.050	2.6%
B9: Kept Me From Adhering To HIV Treatment	-0.048	<b>0.760</b>	0.222	-0.129	1.5%
B10: Kept Me From Getting Info on HIV	-0.020	<b>0.794</b>	0.238	-0.184	0.7%

**Scale C: Sexual Abuse-Related Shame**

C1: Hard To Tell People About Abuse	0.061	0.025	<b>0.755</b>	-0.188	0%
C2: Think Less Of Me Because of Abuse	0.009	0.048	<b>0.829</b>	-0.061	0.4%
C3: Ashamed of Abuse	0.146	-0.065	<b>0.837</b>	-0.076	0%
C4: Feel Worthless Because of Abuse	0.070	-0.035	<b>0.884</b>	-0.014	0%
C5: Hide My Abuse From Others	0.085	0.069	<b>0.775</b>	-0.181	0%
C6: Put Self Down For Abuse	-0.073	0.025	<b>0.875</b>	0.151	0%
C7: Abuse Makes Me Feel Defective	-0.020	0.012	<b>0.883</b>	0.117	0%
C8: Others Reject Me When They Find Out	-0.078	0.038	<b>0.865</b>	0.091	1.1%
C9: Abuse Makes Me Want To Disappear	0.017	0.028	<b>0.779</b>	0.124	0%

**Scale D: Shame Interaction Effects**

D1: Interaction Gay/HIV+ Shame	0.211	0.253	0.307	0.115	<b>21.8%</b>
D2: Interaction Abuse/HIV+ Shame	0.112	0.156	<b>0.632</b>	0.138	0.7%
D3: Interaction IDU/HIV+ Shame	0.233	0.235	-0.045	<b>0.622</b>	<b>33.9%</b>
D4: Interaction Drug Use/HIV+ Shame	0.154	0.094	0.181	<b>0.767</b>	<b>18.1%</b>
D5: Interaction Sex Work/HIV+ Shame	0.162	0.041	0.143	<b>0.709</b>	<b>27.7%</b>

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Table 2: Quartimin rotated factor loadings after removing items due to missing data and poor loadings

	Factor		
	1	2	3
<b>Scale A: HIV-Related Shame</b>			
A1: Hard To Tell People About My Infection	<b>0.720</b>	0.161	-0.219
A2: Failed To Live Up To My Expectations	<b>0.699</b>	0.003	0.001
A3: Expect People To Think Less Of Me	<b>0.758</b>	-0.040	0.096
A4: Put Myself Down For Having HIV	<b>0.767</b>	-0.030	0.218
A5: Feel Defective Cause Of HIV	<b>0.879</b>	-0.139	0.123
A6: Ashamed HIV+	<b>0.886</b>	-0.050	0.081
A7: Expect Rejection When Others Find Out	<b>0.796</b>	-0.100	0.158
A8: Feel Worthless Because HIV	<b>0.728</b>	-0.008	0.237
A9: Ashamed By HIV Symptoms	<b>0.751</b>	-0.006	0.133
A10: Hide Infection From Others	<b>0.784</b>	0.257	-0.164
A11: Dread Others Will Find Out HIV Status	<b>0.746</b>	0.176	-0.069
A12: Deserve To Be Mistreated	0.165	<b>0.551</b>	0.153
A14: HIV Makes Me Want To Disappear	<b>0.540</b>	0.166	0.240
<b>Scale B: Impact of HIV-Related Shame on Behavior</b>			
B1: Kept Me Using Condom	0.204	<b>0.554</b>	-0.130
B3: Kept Me From Interacting With Others	0.213	<b>0.634</b>	-0.124
B4: Kept Me From Applying For Services	0.158	<b>0.642</b>	0.103
B5: Kept Me From Telling Status to Family	<b>0.557</b>	0.365	-0.203
B6: Kept Me From Telling Status To Sex	0.361	<b>0.539</b>	-0.200



## Partner

B8: Delayed Me From Getting Healthcare	0.168	<b>0.625</b>	0.144
B9: Kept Me From Adhering To HIV Treatment	-0.169	<b>0.847</b>	0.166
B10: Kept Me From Getting Info on HIV	-0.111	<b>0.878</b>	0.164

**Scale C: Sexual Abuse-Related Shame**

C1: Hard To Tell People About Abuse	0.021	0.082	<b>0.689</b>
C2: Think Less Of Me Because of Abuse	0.041	0.017	<b>0.796</b>
C3: Ashamed of Abuse	0.147	-0.032	<b>0.798</b>
C4: Feel Worthless Because of Abuse	0.089	-0.003	<b>0.858</b>
C5: Hide My Abuse From Others	0.038	0.134	<b>0.707</b>
C6: Put Self Down For Abuse	-0.025	0.039	<b>0.901</b>
C7: Abuse Makes Me Feel Defective	0.021	0.038	<b>0.898</b>
C8: Others Reject Me When They Find Out	-0.024	0.022	<b>0.874</b>
C9: Abuse Makes Me Want To Disappear	0.059	0.052	<b>0.794</b>
D2: Interaction Abuse/HIV+ Shame	0.162	0.115	<b>0.641</b>

**Reliability estimates<sup>a</sup>**

Cronbach's alpha (N=271)	0.93	0.77	0.93
4-Month Test-Retest Correlation (N=66)	0.83	0.37	0.72

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<sup>a</sup>Reliability estimates include all items in bold for each factor (column).

Table 3: Descriptive Statistics for HIV and Abuse Related Shame Inventory (HARSI) and Validity Measures

Measure (range; direction of coding)	N	Mean	S.D.	Range
<b>HARSI Scales</b>				
HIV-Related Shame	271	17.1	13.4	0 – 50
Impact of HIV-Related Shame on Behavior	271	3.1	4.6	0 – 14
Sexual Abuse-Related Shame	271	14.6	11.2	0 – 40
<b>HIV specific Criterion Measures:</b>				
HIV Physical Symptoms	267	11.8	10.2	0 – 54
HIV-Related Stressors	267	32.3	11.8	13 – 65
Sexual HIV Transmission Risk Behavior	255	<sup>a</sup> 53	<sup>b</sup> 20.8%	--
<b>Psychosocial Criterion Measures:</b>				
TSI: Trauma-Related Symptoms	268	31.3	17.7	0 – 99
TSI: Mood and Anxiety Symptoms	268	29.7	17.6	0 – 73
TSI: Behavioral Difficulties	268	30.9	22.6	0 – 75
SCL-90-R Global Severity Index	271	1.03	0.67	0 – 3.5
Perceived Availability of Social Support	271	28.5	5.5	7 – 35

Note. Ns vary from 267 to 271 as a result of missing data, except Sexual HIV Transmission

Behavior N = 255 due to missing data. Sexual HIV Transmission Behavior (unprotected anal or vaginal intercourse with an HIV negative or serostatus unknown partner in the past 4 months) is a dichotomous indicator, with 0 indicating no transmission risk and 1 indicating transmission risk in the past 4 months. For all continuous measures, higher scores indicate more symptoms, except Perceived Availability of Social Support where higher scores indicate higher levels of support.

<sup>a</sup>Number of participants in sample displaying sexual transmission risk behavior.

<sup>b</sup>Percent of sample displaying sexual transmission risk behavior.

Table 4: Factor Correlations, Convergent and Divergent Validity for HIV and Abuse Related Shame Inventory (HARSI)

	HIV-Related Shame	Effect of HIV-related Shame on Behavior	Sexual Abuse-Related Shame
<b>HARSI Scales</b>			
HIV-Related Shame	---	---	---
Impact of HIV-Related Shame on Behavior	.559**	---	---
Sexual Abuse-Related Shame	.488**	.339**	---
<b>HIV specific Criterion Measures:</b>			
HIV Physical Symptoms	.213**	.215**	.287**
HIV-Related Stressors	.533**	.326**	.367**
Sexual HIV Transmission Risk Behavior	.120	.226**	.081
<b>Psychosocial Criterion Measures:</b>			
TSI: Trauma-Related Symptoms	.416**	.192**	.504**
TSI: Mood and Anxiety Symptoms	.442**	.225**	.452**
TSI: Behavioral Difficulties	.394**	.268**	.448**
SCL-90-R Global Severity Index	.493**	.301**	.562**
Perceived Availability of Social Support	-.154*	-.194**	-.146*

Note. Ns vary from 267 to 271 as a result of missing data, except Sexual HIV Transmission Behavior N = 256 due to missing data.

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).