

Consequences of Child and Adult Sexual and Physical Trauma among Deaf Adults

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The purpose of this study was to evaluate the consequences of sexual and physical trauma among a sample of deaf adults. Thirty-two men and 45 women completed the Life Event Checklist (LEC), the Clinician Administered PTSD Scale (CAPS), the Trauma Symptom Inventory (TSI), the Somatoform Dissociation Questionnaire–20 (SDQ–20) and a sociodemographic questionnaire. In this sample, 40.6% of the male participants and 53.3% of the female participants had experienced some type of sexual trauma during their lifetimes. Physical trauma was reported by 75% of males and 71.1% of female participants. For those who had experienced childhood sexual trauma, the odds ratio of revictimization in adulthood was 6.69. Sexual trauma also rarely occurred by itself. Two thirds of all participants with sexual trauma histories also reported some type of physical abuse. Participants with sexual trauma histories displayed significantly more symptoms of PTSD and depression than people without such trauma history. Physical and sexual abuse represent significant problems in the deaf community. The authors include a call for the development of targeted intervention attempts to prevent further victimization in deaf child and adolescent populations.

KEYWORDS *deafness, physical abuse, PTSD, revictimization, sexual abuse, trauma symptoms, trauma prevalence*

Data from the world literature suggests that deaf individuals experience higher rates of sexual and physical trauma than their hearing counterparts (Bisol, Sperb, Brewer, Kato, & Shor-Posner, 2008; Kvam, 2004). Among a sample of 92 Brazilian students (42 deaf and 50 hearing students) between

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the ages of 15 and 21 years, 31% of the deaf reported a history of sexual trauma compared to only 2% of the hearing students (Bisol et al., 2008). Similarly, Kvam (2004) found twice the base rate for sexual abuse in a sample of deaf Norwegian women (39.6% and 19.2%, respectively), and three times the base rate for the sample of deaf men (32.8% and 9.6%, respectively) compared to hearing samples. Using U.S. deaf child samples, Sullivan, Vernon, and Scanlan (1987) estimated that 54% of deaf boys and 50% of deaf girls had experienced sexual abuse, compared to 10% of boys and 25% of girls from the general hearing population. These base rates might be elevated in comparison to community samples, however, given the higher risk of peer sexual contact in residential settings.

Surprisingly, there is only one available published prevalence study with a U.S. adult nonclinical sample. Schenkel et al. (2014) studied 86 deaf and 61 hard-of-hearing college students recruited through the Rochester Institute of Technology (RIT), which houses the National Technical Institute for the Deaf in Rochester, NY. A Shipley verbal IQ of 75 was required to participate (Schenkel et al., 2014), which raises questions regarding the generalizability of the sample. Several of the measures used, including the measure for trauma exposure (TLEQ; Kubany et al., 2000), required reading levels that would be challenging for such a sample and the authors stated that they “did not use culturally sensitive sign-language based (ASL and signed English) measures” (p. 7). However, Schenkel et al. reported a higher prevalence of child maltreatment in their deaf and hard-of-hearing sample (76%) than in their hearing control group (49%). Given the high risk for maltreatment in deaf and hard-of-hearing samples, Kendall-Tackett, Lyon, Taliaferro, and Little (2005) recommended including disability status in general maltreatment research.

The consequences of child maltreatment in nonclinical deaf adult samples were studied by Schenkel et al. (2014) and Schild and Dalenberg (2012b). Schenkel et al. (2014) measured posttraumatic stress disorder (PTSD) using a 17-item PTSD screener (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996) and included no other measures. No attempt was made to validate the measure for the deaf sample and no psychometrics were reported. In contrast, in Schild and Dalenberg (2012b), the Clinician Administered PTSD Scale (CAPS; Blake et al., 2000) and the Trauma Symptom Inventory (TSI; Briere, 1995) were administered in American Sign Language (ASL) with a written version of the TSI also available to each participant. Psychometrics for each test and concurrent validity for the PTSD measures were presented supporting the use of the instruments chosen. The effect size (percentage of variance accounted for in the criterion) for the relationship between child maltreatment and PTSD was .02 for the Schenkel et al. (2014) study. Schild and Dalenberg (2012b) reported only the relationship between the total experience of lifetime trauma and PTSD as measured by the CAPS ($\eta^2 = .18$) and TSI ($\eta^2 = .16$). Schild and Dalenberg also reported

relationships between lifetime trauma and dissociation as measured by the TSI dissociation scale and the Somatoform Dissociation Questionnaire–20 (SDQ–20; Nijenhuis, 2004). Overall, very little information exists about the true prevalence rates and long-term effects of trauma among the deaf population.

In hearing populations, another outcome of child sexual trauma is elevated probability of adult sexual trauma in both male and female populations (Aosved, Long, & Voller, 2011; Reese-Weber & Smith, 2011). These results have often been attributed to the traumagenic dynamics described by Finkelhor and Browne (1985), that is, early sexual trauma results in the development of traumatic sexualization, betrayal, powerlessness, and stigmatization. These vulnerability factors, especially feelings of powerlessness and stigmatization (Hazzard, 1993), might already be more prevalent among deaf children compared to hearing children regardless of trauma history.

Schenkel et al. (2014) did make some attempts to study increased probability of revictimization in their deaf sample. However, results were presented through a linear regression of dichotomous measures of abuse and neglect on total adult trauma score (a variable with a mean of 3.4, standard deviation not reported). This analysis compounds the potential weaknesses of the use of written measures without ASL translation, raising additional questions of inadequate distribution of criterion and non-normal distribution of predictors. Schenkel et al. did not report the conditional probabilities of adult trauma given child trauma and did not separate the sample by gender for this analysis. Nonetheless, Schenkel et al. did report a significant model of child trauma predicting adult trauma accounting for 27% of the variance. These results are therefore intriguing but not definitive.

Using previously unpublished data from the California Deaf Trauma Study (CDTS) with “gold standard” measures of PTSD (the CAPS and TSD), it was predicted here that deaf adults with sexual abuse histories would show more trauma symptoms than individuals without a sexual abuse history. Further, in keeping with recent advances suggesting the important role of dissociation in PTSD (Carlson, Dalenberg, & McDade-Montez, 2012; Dalenberg & Carlson, 2012), the SDQ was also included to supplement the Dissociation subscale of the TSI. Group differences were predicted on the dissociation variables. In addition, it was predicted that deaf people with histories of childhood sexual and physical abuse would have an elevated probability of physical or sexual abuse in adulthood.

METHOD

Description of Sample

Institutional review board approval was granted by Alliant International University in San Diego, CA. Participants were recruited in the Deaf

community in various locations throughout California. This research project was advertised as a validation study for a new psychological instrument. Participants were informed about the actual research focus after contacting the primary researcher to avoid a sampling bias. No dropouts were reported.

The original CDTS sample included 79 deaf adults. The sample was subdivided into three groups based on trauma histories. Group 1 consisted of 37 individuals: 9 individuals with a sexual abuse history and 28 individuals with both sexual and physical abuse histories (SPA group). The median onset for child sexual abuse was 12 years of age. Given the small number of individuals who experienced only sexual abuse and the failure to find any differences between the sexual abuse subjects with and without physical abuse histories, these two subsamples were combined in further analysis. Group 2 consisted of 28 individuals with physical abuse histories only (PA group) and Group 3 consisted of 12 individuals with no physical or sexual abuse history (control group). Two male participants were eliminated due to conflicting histories of their traumas, making group placement difficult.

The final sample consisted of 77 deaf adults: 32 men and 45 women. Participants' ages ranged from 18 to 83 years ($M = 40.66$, $SD = 16.19$). This sample was culturally diverse including 58.4% White, 18.2% Hispanic, 11.7% Black, and 11.7% participants of other races. The vast majority self-identified as heterosexual (81.8%). The degree of hearing loss is generally measured in decibels (dB) across a wide range of frequencies. In this study, hearing losses ranged from moderately severe (61–70 dB, $n = 12$), to severe (71–89 dB, $n = 21$), to profound (at or above 90 dB, $n = 44$). Conversational speech is typically from 30 to 60 dB. Hearing losses were sustained prelingually ($n = 69$) or during childhood or adolescence ($n = 8$). Seventy-three of the 77 participants preferred ASL over other communication methods, including oral communication. Most participants reported having grown up in hearing families (94.8%) where for the most part, no formal sign language was used. Between a quarter and one third reported residential school placement during elementary school (18.4%), middle school (25.0%), and high school (38.2%). A high school education or less was reported by 32.5% of the participants. In addition, about a third of the participants (37.7%) were employed at the time of the study, and 18.2% were on full-time disability. The overall median income ranged from \$15,000 to \$30,000.

No differences existed between the groups on demographic variables with the exception of sexual orientation. Participants who were not heterosexual were overrepresented in the SPA group, $\chi^2(1, N = 77) = 6.39$, $p < .01$. In this sample, 26 of the 63 (41.3%) heterosexual and 11 of the 14 (78.6%) nonheterosexual participants reported a history of sexual abuse.

Translation Procedure

All written measures were translated into ASL for each of the participants. To ensure consistency, a standard protocol of all written items was created

for the test administration. All items were initially videotaped and evaluated by a native ASL user who was unfamiliar with the original test items. A back-translation was created that was semantically equivalent to the original items, with the exceptions of a few items that were further revised.

Participation in this study did not require any knowledge of English. During the individual testing procedure, each participant was signed the standardized ASL translation and had the option of viewing the original test items for the written measures. As suggested by Schild and Dalenberg (2012b), this type of testing methodology might have had additional benefits for the participants: (a) being able to ask for clarifications, (b) allowing adjustment to a person's idiosyncratic language use, (c) providing the potential for faster response time for those with higher developed language skills, and (d) reducing the probability of leaving items unanswered.

Procedure

After informed consent was explained and obtained, each participant's sign language fluency was assessed to ensure test comprehension. Participants who displayed little or no signing ability were dismissed from the study. Then, each research participant completed the following measures: the demographic questionnaire (DQ), the Life Event Checklist (LEC), the CAPS, the TSI, and the SDQ-20.

Measures

THE LIFE EVENTS CHECKLIST

The LEC (Blake et al., 2000) is a 17-item checklist that assesses a variety of potentially traumatizing events, such as natural disasters, accidents, and sexual and physical assaults (Blake et al., 2000; Weathers, Keane, & Davidson, 2001). The LEC has good psychometric properties with an easy response format (Gray, Litz, Hsu, & Lombardo, 2004). However, to avoid any potential confusion for participants with limited language abilities, the response format was further simplified. First, the 5-point nominal scale (1 = *happened to me*, 2 = *witnessed it*, 3 = *learned about it*, 4 = *not sure*, and 5 = *doesn't apply*) was changed to a 4-point nominal scale (1 = *happened to me*, 2 = *saw it happening to someone else*, 3 = *learned that it happened to someone else*, 4 = *didn't happen*). Participants were also asked to report how often each event had occurred, the age at the time of the event, and which three events had been perceived as the most traumatic. In this study, sexual abuse (SA) was defined as people who endorsed a history of sexual assaults (Item 8) and other unwanted sexual experiences (Item 9), and physical abuse (PA) was defined as people who endorsed a history of physical assaults (Item 6) and assault with a weapon (Item 7) on the LEC.

CLINICIAN ADMINISTERED PTSD SCALE

The CAPS (Blake et al., 2000) was developed to evaluate the 17 PTSD symptoms described in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text revision; American Psychiatric Association, 2003). Among the available PTSD measures, the CAPS is currently regarded as the gold standard (Briere & Scott, 2006). The overall alpha coefficients for the CAPS PTSD symptom clusters are excellent, ranging from .87 for this current deaf sample (Schild & Dalenberg, 2012b) to at or above .94 for various hearing samples (Blake et al., 1995; Hyer, Summers, Boyd, Litaker, & Boudewyns, 1996).

TRAUMA SYMPTOM INVENTORY

The TSI (Briere, 1995) was developed to assess a variety of acute and chronic trauma symptoms in adults. The TSI is a 100-item self-report measure that consists of 10 clinical scales: Anxious Arousal (AA), Depression (D), Anger/Irritability (AD), Intrusive Experiences (IE), Defensive Avoidance (DA), Dissociation (DIS), Sexual Concerns (SC), Dysfunctional Sexual Behaviors (DSB), Impaired Self-Reference (ISR), and Tension Reduction Behavior (TRB). A unique feature of the TSI is its three validity scales: Response Level (RL), unusual or bizarre symptoms (Atypical Response [AR]), and inconsistent or random response patterns (Inconsistent Response [INC]). The psychometric properties of the scale are excellent for both deaf and hearing samples (Briere, 1995; Schild & Dalenberg, 2012a). Among this deaf sample, the reliability coefficients for the clinical scales range between .74 and .91 (Schild & Dalenberg, 2012a), with good convergent validity (r s from .64–.70) between the TSI PTSD scales (i.e., IE, DA, and AA) and the corresponding CAPS clusters (Schild & Dalenberg, 2012b).

SOMATOFORM DISSOCIATION QUESTIONNAIRE–20

The SDQ–20 (Nijenhuis, 2004) consists of 20 items that capture the dimensional construct of somatoform dissociation. Excellent reliability for the SDQ–20 has been reported for hearing samples with alpha coefficients ranging from .95 to .96 (Nijenhuis, 2004). In this study, minor changes were made to the SDQ–20 to eliminate any hearing biases and to avoid confusion. Items 3 and 11 were eliminated, for instance, because they referred to alterations in hearing, and Item 18 was changed from “I cannot speak (or only with great effort)” to “I cannot sign (or only with great effort).” These recommendations were made by Lewis, Dorahy, Lewis, and Baker (2010) for dissociation measures with deaf samples. In addition, the time frame and response format were made consistent with response format from the TSI (i.e., the assessed time frame was shortened from the past year to the past 6 months and the response option was changed from a scale ranging from 1

[*not at all*] to 5 [*extremely*] to a scale ranging from 0 [*never*] to 3 [*often*]). The altered scale has an internal consistency of .69 for this current deaf sample (Schild & Dalenberg, 2012a).

DEMOGRAPHIC QUESTIONNAIRE

The DQ assessed questions about each participant's background, including general demographic information and deafness-related variables. The general demographic questions included age, gender, sexual orientation, education level, and relationship status. Deafness-related questions included cause and degree of hearing loss, age of onset, preferred mode of communication, and family background.

RESULTS

The average age of the first reported trauma was 7.64 years ($SD = 5.76$). All participants in this sample endorsed at least one event on the LEC. For virtually all participants (i.e., 94.8%) the first reported trauma occurred during childhood or adolescence. Table 1 presents the timing of the first trauma occurrence for interpersonal and noninterpersonal traumas. Two thirds of the sample (64.3%) who had experienced a physical trauma reported that this experience had occurred in childhood. The occurrence of serious accidents, exposure to natural disasters, and sexual trauma in childhood were quite common (76.6%, 64.9%, and 48.1%, respectively).

In this sample, 40.6% of men and 53.3% of women experienced some type of sexual trauma. This gender difference was not statistically significant. The average age of the first reported sexual trauma was 17 ($SD = 11.05$); however, 40.5% of the sexual trauma had occurred during childhood. The most recent sexual trauma had occurred an average of 14.16 years earlier ($SD = 13.93$). The likelihood that the first sexual trauma occurred during adolescence was three times higher among deaf women than deaf men. Sexual trauma was also rarely experienced by itself and was more than three times more likely to be comorbid with physical trauma than to have occurred alone. The mean age for the first reported physical trauma was 12.68 ($SD = 10.03$). Sufficient sample size was available to define three groups: those experiencing no physical or sexual abuse (control group), those experiencing physical abuse only (PA group), and those reporting both sexual and physical abuse experiences (SPA group).

Group Comparisons on Trauma Measures

In Table 2, the means and standard deviations for the trauma-relevant measures are given for the SPA group, PA group, and control group.

TABLE 1 Prevalence of First Trauma Occurrence by Type and Trauma Comorbidity

Trauma type and time of occurrence	Personally experienced trauma		Trauma type within gender	
	% (n)	% within trauma type	Male	Female
First sexual trauma ^a				
Childhood	19.5% (15)	40.54%	18.8% (6)	20.0% (9)
Adolescence	16.6% (12)	32.43%	6.3% (2)	22.2% (10)
Adulthood	13.0% (10)	27.03%	15.6% (5)	11.1% (5)
None	51.9% (40)		59.4% (19)	46.7% (21)
First physical trauma ^b				
Childhood	46.8% (36)	64.29%	46.9% (15)	46.7% (21)
Adolescence	11.7% (9)	16.07%	15.6% (5)	8.9% (4)
Adulthood	14.3% (11)	19.64%	12.5% (4)	15.5% (7)
None	27.3% (21)		25.0% (8)	28.9% (13)
First natural disaster				
Childhood	31.2% (24)	48.00%	25.0% (8)	35.6% (16)
Adolescence	19.5% (15)	30.00%	25.0% (8)	15.6% (7)
Adulthood	14.3% (11)	22.00%	15.6% (5)	13.3% (6)
None	35.1% (27)		34.4% (11)	35.6% (16)
First fire or explosion				
Childhood	14.3% (11)	40.74%	6.3% (2)	20.0% (9)
Adolescence	9.1% (7)	25.93%	12.5% (4)	6.7% (3)
Adulthood	11.7% (9)	33.33%	18.8% (6)	6.7% (3)
None	64.9% (50)		62.5% (20)	66.7% (30)
First transportation accident				
Childhood	20.8% (16)	27.12%	12.5% (4)	26.7% (12)
Adolescence	36.4% (28)	47.46%	40.6% (13)	33.3% (15)
Adulthood	19.5% (15)	25.42%	25.0% (8)	15.6% (7)
None	23.4% (18)		21.9% (7)	24.4% (11)
First serious accident ^c				
Childhood	24.7% (19)	48.72%	15.6% (5)	31.1% (14)*
Adolescence	14.3% (11)	28.20%	25.0% (8)	6.7% (3)
Adulthood	11.7% (9)	23.08%	6.3% (2)	15.6% (7)
None	49.4% (38)		53.1% (17)	46.7% (21)
First life-threatening illness or injury				
Childhood	11.7% (9)	32.14%	12.5% (4)	11.1% (5)
Adolescence	9.1% (7)	25.00%	9.4% (3)	8.9% (4)
Adulthood	15.6% (12)	42.86%	21.9% (7)	11.1% (5)
None	63.6% (49)		56.3% (18)	68.9% (31)
First sudden, unexpected death of someone close				
Childhood	20.8% (16)	28.07%	12.5% (4)	26.7% (12)
Adolescence	16.9% (13)	22.81%	15.6% (5)	17.8% (8)
Adulthood	36.4% (28)	49.12%	37.5% (12)	35.6% (16)
None	26.0% (20)		34.4% (11)	20.0% (9)
First trauma of any kind				
Childhood	84.4% (65)	81.3% (26)	86.7% (39)	
Adolescence	10.4% (8)	12.5% (4)	8.9% (4)	
Adulthood	5.2% (4)	6.3% (2)	4.4% (2)	
None	0.0% (0)			

(Continued)

TABLE 1 (Continued)

Trauma type and time of occurrence	Personally experienced trauma		Trauma type within gender	
	% (<i>n</i>)	% within trauma type	Male	Female
Trauma comorbidity				
Physical abuse alone	36.4% (28)	43.08%	43.8% (14)	31.1% (14)
Sexual abuse alone	11.7% (9)	13.85%	9.4% (3)	13.3% (6)
Both	36.4% (28)	43.08%	31.3% (10)	40.0% (18)
Neither	15.6% (12)		15.6% (5)	15.6% (7)
Within trauma group, perceived as among the worst three traumatic experiences				
Sexual abuse	51.35% (19/37)		12.5% (4)	33.3% (15)*
Physical abuse	50.92% (28/56)		25.0% (8)	44.4% (20)
Natural disasters	34.00% (17/50)		28.1% (9)	17.8% (8)
Serious accident	25.64% (10/39)		15.6% (5)	11.1% (5)
Transportation accident	24.16% (14/59)		28.1% (9)	11.1% (5) [^]

Note. *N* = 77. Childhood is defined as ages 0–13. Adolescence is defined as ages 14–21. Adulthood is defined as 22 years of age or older.

^aSexual abuse was defined as sexual assaults and other unwanted sexual experiences. ^bPhysical abuse was defined as physical assaults and assaults with a weapon. ^cSerious accidents included accidents at work, home, or during recreational activities.

[^]*p* < .10. **p* < .05.

Reexperiencing and Hyperarousal as measured by the CAPS were significantly higher in the SPA group than in the other two groups. Similarly, the SPA group was higher than the PA group for the Anxious Arousal, Depression, and Defensive Avoidance scales of the TSI, and higher than the control group for Intrusive Experiencing and Defensive Avoidance. As can be seen in Table 2, the variance accounted for in the CAPS and TSI subscales was quite high, with the abuse status accounting for 17.5% of the variance in the total CAPS score. No differences between groups on the two dissociation scales (SDQ and TSI-DIS) were found. Physical abuse and no abuse groups were not significantly different on any CAPS or TSI scale. When gender was crossed with trauma type, no significant interaction emerged for any variable. Thus, hypotheses were supported for group differences in PTSD symptoms, but not for dissociation variables.

Revictimization Probability

Table 3 presents the probabilities of adult sexual and physical trauma given child or adolescent physical or sexual trauma. This analysis was conducted for participants 25 years and older only (i.e., 82% of the sample). The probability of adult sexual trauma was substantially higher in the group reporting child and adolescent sexual trauma (68.1%) compared to those with no sexual trauma (24.3%), $\chi^2(1, N = 63) = 11.47, p < .001, OR = 6.69$. Child or adolescent sexual trauma status also predicted an elevated report of adult

TABLE 2 Analysis of Variance Comparing Lifetime Sexual Abuse, Physical Abuse, and Other Trauma

Scale	Lifetime SPA ^a	Lifetime PA ^b	Control ^c	Total ^d η ²	SPA ^e η ²	F
CAPS						
Reexperiencing	8.78 _a (7.32)	3.96 _b (5.42)	3.08 _b (4.93)	.160	.142	6.23**
Avoidance	11.64 _a (9.73)	7.43 _{ab} (8.06)	3.33 _b (4.70)	.135	.093	4.87**
Hyperarousal	9.00 _a (8.09)	4.93 _b (5.80)	3.33 _b (5.80)	.121	.098	4.27*
Total	29.43 _a (26.23)	16.32 _b (7.47)	9.75 _b (13.97)	.175	.139	6.58**
TSI						
Anxious Arousal	53.49 _a (8.86)	47.75 _b (7.08)	48.33 _{ab} (11.45)	.097	.096	3.93*
Depression	55.32 _a (10.84)	49.68 _b (8.19)	51.42 _{ab} (13.99)	.058	.058	2.40 [^]
Anger/Irritability	54.00 _a (13.01)	50.64 _a (9.90)	50.00 _a (10.67)	.024	.024	.91
Intrusive Experiences	56.00 _a (10.70)	51.39 _{ab} (8.61)	49.25 _b (10.21)	.084	.068	2.90 [^]
Defensive Avoidance	57.65 _a (11.42)	52.54 _b (6.73)	49.08 _b (11.00)	.092	.090	4.23*
Dissociation	56.89 _a (12.29)	53.54 _a (9.15)	55.00 _a (12.69)	.017	.017	.71
Sexual Concerns	53.89 _a (12.48)	49.71 _a (9.15)	48.42 _a (8.02)	.049	.045	1.79
Dysfunctional Sexual Behavior	60.65 _a (16.79)	56.54 _a (11.75)	52.00 _a (7.94)	.064	.038	1.90
Impaired Self-Reference	58.46 _a (13.78)	53.18 _a (8.28)	55.92 _a (12.48)	.043	.035	1.58
Tension Reduction Behavior	61.16 _a (16.62)	56.26 _a (10.38)	58.42 _a (17.32)	.024	.021	.89
SDQ-20						
Total	3.15 _a (4.08)	2.11 _a (2.38)	2.64 _a (4.32)	.036	.016	.65

Note. Means sharing a common subscript are not significantly different. SPA = sexual and physical abuse; PA = physical abuse; Control = no abuse; CAPS = Clinician Administered PTSD Scale; PTSD = posttraumatic stress disorder; TSI = Trauma Symptom Inventory; SDQ-20 = Somatoform Dissociation Questionnaire-20.

^an = 37. ^bn = 28. ^cn = 12. ^dTotal variance accounted for. ^eVariance accounted for by the sexual abuse variable contrasted with other groups. ^{*}p < .10. ^{**}p < .05. ^{***}p < .001.

TABLE 3 Conditional Probability of Adult Sexual and Physical Trauma Based on Childhood Histories and Odds Ratios for Revictimization

Status	Present	Absent	OR
Adult sexual trauma			
Child or adolescent sexual trauma status	68.18% (15/22)	24.39% (10/41)***	6.69
Child or adolescent physical abuse status	37.14% (13/35)	42.86% (12/28)	.79
Child or adolescent sexual or physical abuse status	42.86% (18/42)	33.33% (7/21)	1.50
Adult physical trauma			
Child or adolescent sexual trauma status	63.64% (14/22)	36.58% (15/41)*	3.01
Child or adolescent physical abuse status	54.29% (19/35)	35.71% (10/28)	2.13
Child or adolescent sexual or physical abuse status	57.14% (24/42)	23.81% (5/21)*	4.29

Note. Sexual abuse was defined as sexual assaults and other unwanted sexual experiences. Physical abuse was defined as physical assaults and assaults with a weapon. Childhood was defined as ages 0–13. Adolescence was defined as ages 14–21. OR = odds ratio.

* $p < .05$. *** $p < .001$.

physical trauma status (57.1%) relative to the no child or adolescent trauma group (23.8%), $\chi^2(1, N = 63) = 4.22, p < .05, OR = 3.01$. In contrast, child or adolescent physical trauma status was unrelated to either adult physical trauma or adult sexual trauma. The results support the hypothesis of elevated risk of adult sexual trauma for deaf adults reporting childhood sexual trauma.

Analysis of Traumatic Consequences of Child versus Adult Sexual Trauma

Table 4 shows the analysis of variance results crossing the adult sexual abuse and child sexual abuse status variable. No interactions appeared. As can be seen, the main effect for adult sexual abuse occurred only on the PTSD variables (CAPS Reexperiencing, Hyperarousal, and Total PTSD symptoms and TSI Anxious Arousal), whereas the effects for child sexual trauma were more ubiquitous. The largest effect sizes for the child sexual abuse status variable appeared for Sexual Concerns ($\eta^2 = .125$) and CAPS Hyperarousal ($\eta^2 = .097$). The results for the trauma consequence variables were therefore generally additive, with adult trauma adding variance to that contributed by childhood trauma in predicting degree of symptom elevation.

DISCUSSION

If generalizations can be made from this sample, the vast majority of deaf children enter adulthood having experienced a potentially traumatizing life event during childhood or adolescence. The most common form of childhood trauma was physical abuse, characterizing 46.8% of the sample,

TABLE 4 Analysis of Variance Results for Revictimization Data

Scale	No child sexual abuse		Child sexual abuse		ASA <i>F</i>	CSA <i>F</i>
	No ASA ^a	ASA ^b	No ASA ^c	ASA ^d		
CAPS						
Reexperiencing	3.70 (5.23)	7.50 (8.00)	6.92 (5.32)	11.13 (8.03)	4.35*	5.97*
Avoidance	6.20 (7.41)	7.00 (7.90)	10.08 (8.48)	16 (10.45)	8.78**	2.39
Hyperarousal	4.45 (5.77)	8.30 (8.58)	5.83 (5.88)	12 (8.69)	2.02	7.85**
Total	14.35 (16.61)	22.80 (20.67)	22.83 (16.38)	39.13 (22.46)	6.65*	6.61*
TSI						
Anxious Arousal	47.93 (8.47)	50.08 (6.11)	52.60 (9.94)	56.80 (9.32)	6.48*	2.02
Depression	50.20 (10.11)	56.70 (12.60)	53.08 (9.11)	56.20 (11.32)	.19	3.02 [^]
Anger/Irritability	50.45 (10.00)	54.60 (15.06)	52.17 (11.11)	54.40 (13.69)	.01	1.16
Intrusive Experiences	50.75 (9.04)	57.70 (11.78)	53.17 (10.02)	57.13 (10.76)	.13	4.42*
Defensive Avoidance	51.50 (8.23)	57.60 (11.02)	55.17 (10.46)	59.67 (12.70)	1.12	4.14*
Dissociation	53.97 (10.19)	57.40 (13.23)	57.00 (13.35)	56.47 (11.63)	.12	.23
Sexual Concerns	49.33 (8.74)	56.30 (11.20)	47.17 (8.41)	57.67 (14.37)	.02	10.43**
Dysfunctional Sexual Behavior	55.18 (10.85)	61.89 (13.75)	55.75 (14.83)	63.73 (19.96)	.11	4.02*
Impaired Self-Reference	54.00 (9.64)	62.60 (15.54)	54.67 (10.71)	58.73 (14.78)	.27	4.21*
Tension Reduction Behavior	56.92 (12.66)	65.10 (18.67)	56.33 (14.99)	62.40 (16.63)	.18	3.42 [^]
SDQ-20						
Total	2.26 (3.00)	2.20 (2.86)	2.44 (3.13)	4.20 (5.13)	.76	1.26

Note. ASA = adult sexual abuse; CSA = child sexual abuse; CAPS = Clinician Administered PTSD scale; PTSD = posttraumatic stress disorder; TSI = Trauma Symptom Inventory; SDQ-20 = Somatoform Dissociation Questionnaire-20.

^a*n* = 40. ^b*n* = 10. ^c*n* = 12. ^d*n* = 15.

[^]*p* < .10. **p* < .05. ***p* < .01.

including physical assaults (e.g., being attacked, hit, slapped, beaten, or kicked) and assault with a deadly weapon (e.g., being shot, stabbed, or being threatened with a knife or gun). Importantly, this is not a clinical sample, where reports of trauma in hearing (Jacobson & Herald, 1990; Read, 1997) and deaf samples (Black & Glickman, 2006; Willis & Vernon, 2002) tend to be substantially higher. Based on our findings, the likelihood that a deaf client is a trauma survivor is very high. The need for further trauma research and a better understanding of posttraumatic stress reactions among people who are deaf and hard of hearing has also been identified as one of the main research priorities in the field of deafness (NASMHPD, 2012).

In summarizing several studies that examined child sexual maltreatment among deaf children, Sullivan et al. (1987) concluded that 54% of deaf boys and 50% of deaf girls have experienced some type of sexual abuse. These frequencies are substantially higher than the finding of this sample (i.e., 18.8% of boys and 20% of girls with sexual trauma histories in childhood). The samples for Sullivan et al.'s analysis were predominately children attending residential schools for the deaf, a subgroup reported by these authors at higher risk for sexual abuse than were children who were mainstreamed. In this study, only 42.9% of the sample had any residential school experience. This figure is more comparable to the percentage of deaf students in the United States who have some residential school education, although this percentage has drastically decreased in recent years (Moore, 2009). The prevalence figures for child or adolescent trauma for women (42.2% for sexual abuse and 55.6% for physical abuse) are similar to hearing samples, whereas the figures for men (25.1% for sexual abuse and 62.5% for physical abuse) are substantially higher than published hearing norms (Kessler, Sonnega, Bromet, & Hughes, 1995; Stein, Walker, & Forde, 2000). One possible reason for this difference might be the greater difference in acceptance of touch between hearing boys and deaf boys compared to hearing girls and deaf girls. The norm of low acceptance of affectionate touch between same-sex peers in hearing populations (Burgoon, Walther, & Baesler, 1992) might be somewhat protective for hearing boys. Alternate reasons for this gender difference should be examined in further research.

Vulnerability to Sexual Abuse

A number of variables that could increase the likelihood of childhood and adulthood sexual abuse among people who are deaf include (a) inability to report the abuse; (b) perpetrator reaction to deaf children's culturally appropriate behaviors, such as increased use of touch, and animated facial expressions; (c) lack of knowledge about appropriate sexual behaviors and sexual boundaries; (d) increased likelihood of dissociation; (e) limited coping skills and resources to deal with the trauma; and (f) comorbid cognitive impairment.

The tendency for perpetrators to choose vulnerable children—for instance, children with little supervision or children with disabilities—is well known (Salter, 2003). Over 95% of deaf children are born to hearing parents (Mitchell & Karchmer, 2004), who for the most part do not communicate fluently with their deaf child in sign language (Glickman & Gulati, 2003). This barrier to communication between parent and child might place the deaf child at risk for being victimized. Additional risk might be associated with other cognitive impairment that is more prevalent in deaf children due to certain etiologies related to their deafness (Gallaudet Research Institute, 2008). Language also might limit the child's access to child abuse prevention literature, as well as the pervasive culturally mediated education provided through literature and television on the appropriate response to predatory adult behavior. Schild and Dalenberg (2012b) also presented arguments that lack of information increases a person's general vulnerability to traumatization by negatively affecting factors such as controllability, suddenness or predictability, and negativity. There is some empirical and theoretical evidence suggesting that deaf people might be more vulnerable to dissociation than hearing individuals (Schild & Dalenberg, 2012a, 2012b). Dissociation might enhance risk for several reasons, including the enhanced use of avoidance of trauma-relevant thought (including thoughts about self-protection), lower awareness of signs of danger in the environment, and greater use of mind-altering substances in dissociative adolescents and adults (Carrion & Steiner, 2000; Chu, 1992; Najavits & Walsh, 2012; Wilson, Calhoun, & Bernat, 1999).

Further, the obstacles to the development of communication between hearing and deaf groups virtually necessitates the use of touch as a method of communication of emotion (e.g., anger and affection) and need (e.g., attempts to direct another's attention). The frequent admonition of the parent of the hearing child ("Use your words") is simply unavailable to the parent of the deaf child, who does not typically discourage their child's use of touch or unusual levels of body contact (e.g., grabbing and directing mother's hand toward a needed object). Clinically, both authors have noted the increased levels of interpersonal touch within the deaf community, a set of learned and at times culturally appropriate behaviors, which might be misinterpreted or misused by sexually abusive adults.

Besides the aforementioned vulnerability factors, further research is also needed to evaluate the traumagenic dynamics described by Finkelhor and Browne (1985), such as traumatic sexualization, betrayal, powerlessness, and stigmatization. The results reported here suggest that those with a greater history of traumatic sexualization (e.g., the sexually abused group) had more difficulties in their adult years. Further those with a potentially greater burden of stigma (e.g., the sexual minorities) were more likely to be included in the highest risk group. The sample size did not allow breakdown by perpetrator type, a variable that might allow study of betrayal (e.g., comparing parental abusers to other abusers), or capacity to communicate with hearing adults (a variable that might impact sense of powerlessness).

Consequences of Sexual Trauma

Those who experienced childhood trauma showed reliably higher symptoms on the CAPS and TSI. The majority of this variance was due to the experiences of sexual abuse. One could argue that these results are a by-product of social desirability effects, as some participants might be more willing to disclose both psychopathology and sexual abuse. However, it is noteworthy that differences between groups as shown in [Table 2](#) emerged on the three scales measuring the PTSD clusters on the TSI and CAPS together with depression and not on the remaining six TSI scales. This finding would argue against an explanation based purely on self-report bias.

The striking aspect of the pattern is the degree that the symptoms reported reflect the most central PTSD-related symptoms. More specifically, groups differed reliably on measures of reexperiencing, avoidance, and hyperarousal but did not differ on measures of sexual concerns, impaired self-reference, anger and irritability, or tension reduction. The most common treatment for the reexperiencing, avoidance, and hyperarousal symptoms of PTSD is exposure therapy (Foa, Hembree, & Rothbaum, 2007), a treatment that relies heavily on the capacity to communicate emotional experiences. Further treatment outcome studies with traumatized deaf individuals are sorely needed, perhaps utilizing a therapy that is less reliant on the use of language (Fine & Berkowitz, 2001; Maxfield, 2003), such as eye movement desensitization and reprocessing therapy (Shapiro, 2001).

Revictimization

The adults who had been exposed to childhood sexual trauma were at more than twice the risk for adult sexual trauma (68.1% vs. 24.3%) compared to those who had not experienced child or adolescent sexual trauma. This represents an odds ratio of 6.69, substantially higher than the community samples of Russell (1986, 2.0) and Wyatt, Guthrie, and Notgrass (1992, 2.4) as estimated by Rich, Combs-Lane, Resnick, and Kilpatrick (2004). In hearing samples, mediating variables have rarely been examined. However, both Ullman, Najdowski, and Filipas (2009) and Kilpatrick, Acierno, Resnick, Saunders, and Best (1997) cited drug and alcohol use as a moderator of the revictimization effect. Substance use was not examined in depth in this study, although it has been reported as a problem within the deaf community (Guthmann & Graham, 2004). This would present a focus for further research with deaf samples.

Limitations of the Study

Although this research constitutes one of the larger samples of deaf trauma survivors in the literature, many of the analyses conducted were limited

in power due to the low number of deaf adults lacking trauma histories. The conditional probability analysis, although informative, also should be repeated with larger samples. The limited language capacity of this sample is both a strength and a weakness of this research. The adult samples that are typically used—for example, college students at RIT (Schenkel et al., 2014)—do not represent the average language abilities of the Deaf community. On the other hand, the poor language skills of our sample is a weakness, in that individuals in our sample would have had variable understandings of the written material presented to them. This was addressed by providing a signed translation to each research participant. Nonetheless, some participants had the benefits of both the English and the ASL translation, whereas others had to rely solely on the translation due to their limited English skills. We are not advocating either strategy (inclusion or exclusion of deaf participants who are not English literate), but recognize that conclusions based on the two methodologies could differ.

Further information might have also been gathered regarding location of abuse and perpetrator type and relationship. Peer sexual contact is a known issue in residential Deaf communities, partially due to the greater need for communication by touch in deaf children, and might have contributed to the high rates of sexual abuse found here (Sullivan et al., 1987). The sexual contact between a child and either an older peer or a caretaker could constitute betrayal trauma for the victim (Freyd, 1996) and might relate more strongly to subsequent symptoms than would be true for sexual abuse perpetrated by a stranger.

Conclusions

As Schild and Dalenberg (2012a, 2012b) pointed out, there is still much to learn about trauma responses in the deaf population. In this deaf sample, physical and sexual trauma were highly comorbid. The greater reliance on touch as communication between deaf children, adolescents, and adults, and the parallel deficits in societal alternative forms of communication with deaf children, could present vulnerability factors for sexual and physical boundary violations. Given the high rates of sexual and physical abuse and the likelihood of revictimization, early targeted interventions need to be developed. Advances in the study of the deaf will also be reliant on the development of more validated instruments measuring personality and psychopathology that are linguistically and culturally appropriate to the deaf research participant.

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