



Review Article

A Psychometric report on Yost's Attitudes toward Sadomasochism Scale

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Abstract

We collected data from three samples of participants who completed Yost's (2010) Attitudes about Sadomasochism Scale (ASMS) along with a number of other related measures with the goal of providing independent validation of the ASMS. Using a small, university sample and two larger internet samples, we provided concurrent validity by presenting moderate-to-strong correlations of the ASMS with a BDSM semantic differential attitude scale, interest in sadomasochism items, and self-assessed sadomasochism knowledge. Further, the ASMS correlated well with measures of erotophobia--erotophilia (i.e., personal comfort with sexuality). There were differences on the ASMS and its subscales based on participant sexual orientation, with sexual minorities demonstrating more favorable scores on the ASMS compared to heterosexuals. Also, those who self-reported that they were more religious were less favorable on the ASMS. There were no differences on the ASMS as a function of gender (men versus women), age cohort, regional location in the US, or environmental residence (rural, suburban, or urban). A confirmatory factor analysis supported Yost's original factor structure although deletion of a two-item subscale was recommended. In general, attitudes toward sadomasochism were slightly favorable for the entire sample. We concluded that the ASMS is a valid and reliable measure for the assessment of attitudes toward sadomasochism and recommend its use in future investigations.

Key words : ASMS, BDSM, Erotophobia, Erotophilia

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Introduction

BDSM* (sometimes referred to as SM) is a compound acronym meaning bondage, discipline, dominance, submission, and sadomasochism. BDSM is typically characterized by an interest in consensual sexual play within the areas of pain, confinement, humiliation, and power (Barker, Iantaffi, & Gupta, 2008). Recent research has shown that arousal from or interest in these behaviors is relatively common (Freeburg & McNaughton, 2017; Joyal & Carpentier, 2017; Joyal, Cossette, & Lapierre, 2015) and rapidly growing (Hillier, 2018). The popularity of BDSM in media culture has increased in recent years following a number of films and literature involving the topic (e.g., the documentary 'Kink' by James Franco and Christina Voros in 2013, the 'Fifty Shades of Grey' trilogy by E. L. James in 2011, and the consequent films in 2015, 2017, and 2018); however, an increase in popularity has had minimal impact in reducing stigma toward BDSM practices and participants (e.g., Bezreh, Weinberg, & Edgar, 2012) and can even increase stigma via negative portrayals (Yost, 2010). Some BDSM practitioners experience 'felt stigma' – an internalized perception and expectation of being devalued

(Gray, 2002) – as a result of their sexual practices, which they may consider a component of their sexual identity (i.e., a sexual behavior preference or orientation; Kolmes, Stock, & Moser, 2006; Worthington, Savoy, Dillon, & Vernaglia, 2002).

Most research related to BDSM stigma focuses on either the felt stigma of members of the BDSM community (Bezreh, et al., 2012; Waldura, Arora, Randall, Farala, & Sprott, 2016) or pathologizing stigma from clinical and legal professionals (e.g., Dunkley & Brotto, 2018; Hillier, 2018; Wright, 2014; 2018). There is a paucity of research examining the general public's attitudes towards BDSM behavior and persons who practice BDSM. As well, consistent use of an established measure of BDSM attitudes is non-existent. Rye, Serafini, and Bramberger (2015) assessed university women's attitudes toward BDSM using a 6-item measure of BDSM beliefs written specifically for the study as no standardized measure existed at the time of data collection (i.e., 2010). Since then, the Attitudes about Sadomasochism Scale (ASMS) was published by Yost (2010). The ASMS was designed to measure participants' attitudes regarding sadomasochism (SM) through four subscales, entitled

* BDSM and SM will be used interchangeably, though the acronyms are not exact synonyms.

Socially Wrong, Violence, Lack of Tolerance and Real Life.

The Socially Wrong subscale consists of 12 items addressing respondents' moral views of SM and the belief that SM is socially objectionable. The items include a mix of belief statements about SM as a practice (e.g., 'Sadomasochism is a perversion') as well as beliefs about SM practitioners (e.g., 'Sadomasochists just don't fit into our society'). The 5-item Violence subscale assesses beliefs about SM practitioners regarding sexual /relational violence and belief in the psychopathology of SM (e.g., 'A Dominant is more likely to rape a romantic partner than the average person'). Lack of Tolerance is a 4-item, favorability-toward-SM subscale whereby items represent positive beliefs about SM and SM practitioners. It is reverse-coded so that higher scores represent more negative responses toward SM so as to be consistent with the other subscales. Finally, the Real Life subscale consists of two items addressing the everyday character of SM practitioners in non-sexual aspects of their lives (i.e., are they passive or aggressive?). These four subscales were derived from an exploratory factor analysis, were supported by a confirmatory factor analysis with a different sample, and were consistent with the literature review provided.

While Yost (2010) presents an excellent psychometric description of the development and validation of the ASMS, no other publications have described psychometric properties of this instrument. Establishing the validity of an instrument allows a field to have a standardized measure that can be used to assess across studies. Therefore, the purpose of the current paper was to present an independent psychometric evaluation of the ASMS.

Yost (2010) tested for relationships between the ASMS and some demographic variables (e.g., gender, religious fundamentalism) but we included other variables in order to extend Yost's findings. Differences in attitudes toward sexual content between men and women have often been reported in the sexuality literature (Cowan & Dunn, 1994; Dawson, Bannerman, & Lalumière, 2016; Doornwaard, Bickham, Rich, ter Bogt, & van den Eijnden, 2015; Peterson & Hyde, 2010). However, some of these gender disparities appear to be dissipating over time and men and women's attitudes toward other sexual practices (e.g., sexual permissiveness, extramarital sex) no longer differ (Peterson & Hyde, 2011). Gender and/or sex differences toward sexuality-related material, behaviors, and groups appear to be minimizing; however, research on gendered attitudes toward BDSM, which is

arguably more sexually extreme compared to 'vanilla' sexual activity (Turley & Butt, 2015), is minimal. Comfort with sexuality was explored in relation to the ASMS, as well. Further, an individual's age (e.g., Twenge, Sherman, & Wells, 2015), religiosity (e.g., Beckwith & Morrow, 2005; Sümer, 2015), sexual orientation, and geographical location (i.e., within the United States) can potentially impact attitudes toward sexuality and sexual behaviors; therefore, differences in attitudes toward BDSM based on age, religiosity, sexual orientation, and location were also be explored.

Method

Materials

Attitudes toward Sadomasochism scale (ASMS). All participants received the ASMS developed by Yost (2010), which consists of 23 belief-based statements (e.g., 'I think sadomasochists are disgusting', 'Sadomasochism is erotic and sexy') to which participants responded on a 7-point agree-to-disagree scale. The overall alpha for the scale ($N=622$) was very high ($\alpha=.97$).

Construct Validity

BDSM-Related Measures.

Construct validity is a means of assessing whether a scale is measuring the underlying theoretical construct that it is purporting to measure. One way to establish

construct validity of a scale is to correlate the instrument with other measures of the same construct or related constructs. Three instruments were used to help assess the construct validity of the ASMS: traditional BDSM semantic differential attitude assessment (Petty & Cacioppo, 1980), amenability or interest in engaging in SM, and knowledge about SM.

BDSM Semantic Differential Attitude scale.

The BDSM Semantic Differential scale asked participants the following question: "My opinion of BDSM* (Bondage, Dominance, Sado-masochism) is:" rated with four pairs of bipolar adjective: unfavourable-favourable, positive-negative, good-bad, and awful-nice, with five positions in between the adjectives. Each adjective pair was coded such that a higher score (5) indicated a more positive attitude toward BDSM and then the four were averaged. The semantic differential scale demonstrated strong internal consistency ($N=475$; $\alpha=.95$).

Interest in Sadomasochism. The Interest in SM scale consisted of five items (i.e., 'I have engaged in SM behaviors or practices'; 'I would not object to engaging in SM'; 'I would not object to a partner wanting to try SM with me'; 'I am

* These terms were defined for participants at the beginning of the study

interested in trying SM with a new partner'; and 'I am interested in trying SM with my current partner') to which participants responded on the same 7-point agree-to-disagree scale as used in the ASMS. In its aggregated, averaged form, higher scores represented greater interest. This scale demonstrated good reliability ($N=654$; $\alpha=.89$).

SM Knowledge (Yost, 2010). Yost also outlined a 5-item, SM knowledge measure using the same 7-point disagree-agree scale (e.g., 'I have never heard of SM before today', 'I know with absolute certainty what SM involves') which was included at the end of the ASMS. We aggregated the items to produce a self-assessed knowledge about SM scale which demonstrated acceptable reliability ($N=477$; $\alpha=.78$) where high scores represented higher self-rated SM knowledge. This score represented participant familiarity with SM which could be an indirect indicator of openness to learning about SM.

Erotophobia–erotophilia Instruments. Erotophobia–erotophilia is defined as a dimension of personality theorized as a learned response to sexual stimuli with negative-to-positive affect and evaluation. This personality disposition is believed to determine avoidance or approach responses

to sexual stimuli (Fisher, Byrne, White, & Kelley, 1988).

Sexual Opinion Survey. The Sexual Opinion Survey is the classic instrument assessing the theoretical construct of erotophobia–erotophilia. It includes 21-items pertaining to sexuality issues in relation to the self (e.g., 'Seeing an erotic movie would be sexual arousing to me'). There is substantial research supporting the validity and reliability of this instrument (Rye & Fisher, 2020; Rye, Serafini, & Bramberger, 2015). As in many past studies, the Sexual Opinion Survey demonstrated strong internal consistency with the current participants ($N=456$; $\alpha=.91$).

Sexual Liberalism Scale. The Sexual Liberalism Scale (Rye, Traversa, Serafini, & Bramberger, 2020) is a 29-item instrument that assesses comfort with sexuality; it covers more current sexual constructs, such as internet sexuality and sex toy use (e.g., 'Using a webcam with someone in a sexy way is fun'), relative to the items contained in the Sexual Opinion Survey. In the current study, the Sexual Liberalism Scale had good reliability ($N=438$; $\alpha=.88$). The Sexual Opinion Survey and the Sexual Liberalism Scale were assessed on the same 7-point agree-to-disagree scale used for the AMSM.

Sexual Anxiety Scale. Fallis, Gordon, and Purdon (2020) developed the 56-item Sexual Anxiety Scale (e.g., ‘Telling my partner what pleases me and does not please me sexually’) to measure erotophobia–erotophilia with a more clinical, functional focus. Specifically, the response scale was more affect-related, ranging from extremely discomforting-to-extremely comfortable on a 7-point scale. This instrument was highly internally consistent ($n=75$; $\alpha=.95$).

All erotophobia–erotophilia instruments were coded and averaged such that high scores represented greater erotophilia.

Participants

There were three samples of participants; the first was a university sample who participated as part of a research participation option for Psychology course credit while the other two samples were obtained through Amazon's Mechanical Turk (MTurk) and were paid for completing the survey.

Sample 1: University Men. Male post-secondary students were solicited through an online Psychology research portal website. In total, 82 men completed the questionnaire; however, due to technical difficulties, only 62 were asked about their age and sexual orientation. On average, 92% fell

within 19-29 years of age cohort and 92% identified as heterosexual.

Sample 2: MTurk Internet. Using MTurk, 196 people who lived in the United States completed a version of the questionnaire. Due to technical difficulties, no demographic information was collected (e.g., gender composition is unknown).

Sample 3: MTurk Internet. After correcting technical errors, an additional 400 US participants were solicited from MTurk. Approximately 45% identified as female ($n=178$) and 55% as male ($n=217$); three identified as non-binary/gender-queer and two provided no response. In terms of sexual orientation, 86% identified ($n=343$) as heterosexual while smaller numbers identified as sexual minorities: bi/pan $n=35$; gay/lesbian $n=18$, asexual $n=2$, and unknown $n=2$. Age was measured in cohort groupings: 26% were emerging adults (aged 18-29 years), 37% were 30-39 years of age, 8% were 40-49, 24% were 50-59, 4% were 60-69 years, and 1% indicated they were over 70 years of age.

Sample 3 were asked their ethnicity in free-response format. Coding was difficult as responses involved race or ethnicity or both. Most participants reported that they were White (60%), followed by participants who simply responded

that they were 'American' (19%) About 8% indicated they were Asian and about 7% indicated that they were black/African American while around 4% indicated they were Hispanic/Latino. Slightly over 1% combined identified as Native American or Pacific Islander or Middle Eastern. In terms of their location in the United States, 38% were from the south, 22.5% from the midwest, 21.5% from the west, and 18% from the northeast (based on United States Census Bureau statistical region divisions). When asked about what type of environment they lived, 50% indicated living in a suburban region, 31% in an urban area, and 19% in a rural region.

This group also provided information about how religious they were; on a 5-point ordinal scale, the majority rated themselves as not-at-all religious (53%) while few were extremely religious (5%); these were the poles of the scale. Twenty percent rated themselves as moderately religious, 9% as in between, and 13% as slightly religious.

Procedure

Participants in all samples received the ASMS, the Interest in SM scale, the Sexual Opinion Survey, and the

Sexual Liberalism Scale. The University Men and MTurk Sample 3 received the BDSM semantic differential scale and Yost's SM knowledge instrument but Sample 2 did not. Only the University Men Sample 1 was presented with the Sexual Anxiety Scale. Only MTurk Sample 3 received the single item measure of religiosity. It is noteworthy that MTurk Sample 2 was not presented with the last two questions on the ASMS.*

The University Men (Sample 1) signed up for the study on a research participation website. They were given a paper version of the questionnaire and allowed to complete it in a nearby classroom or take it home, complete it, and bring it back to the research assistant at her office. Samples 2 and 3 were solicited through Amazon's MTurk, completed the questionnaire online, and were compensated in American currency. All participants received an information letter before indicating their consent to participate. At the end of the study, all participants were given debriefing materials. The materials and procedures received approval from the Institutional Research Ethics Board.

*The University Men sample preceded the MTurk Samples. The Sexual Anxiety Scale was dropped from the MTurk questionnaire because it was long, expensive, and there already were two measures assessing erotophobia—erotophilia. MTurk Sample 2 had technical difficulties such that several items and instruments were erroneously omitted.

Results

Descriptive information about the Attitudes toward Sadomasochism Scale

The ASMS could range from 1 (most negative toward SM) to 7 (most positive toward SM). Combining all samples into one large group ($N=670$), the actual scores ranged from 1 to 7 with a mean of 5.44, median of 5.86, and mode of 7.00 while the standard deviation was 1.34. On average, the participants were slightly positive toward SM. While the ASMS demonstrated no kurtosis deviating from normal (based on the kurtosis to its standard error ratio), the distribution of the ASMS was significantly non-normally skewed (again, based on the ratio of skewness to the standard error of skewness). Inspection of Figure 1

clearly demonstrates that the ASMS is skewed toward positive evaluation of sadomasochism.

Based on statistics presented by Yost (2010), we estimate that our sample was significantly more favorable on the ASMS scale than the Yost sample ($t(1151)=12.09$, $p<.0001$, Hedges' g effect size=.73). This may be a function of the different composition of our respective samples (Yost had undergraduate students only whereas our sample was predominantly obtained through MTurk) or time (our sample was obtained 5-10 years later, after increased BDSM cultural popularity).

Because the three samples came from different sources, they were tested to determine if there were differences in the total ASMS score.

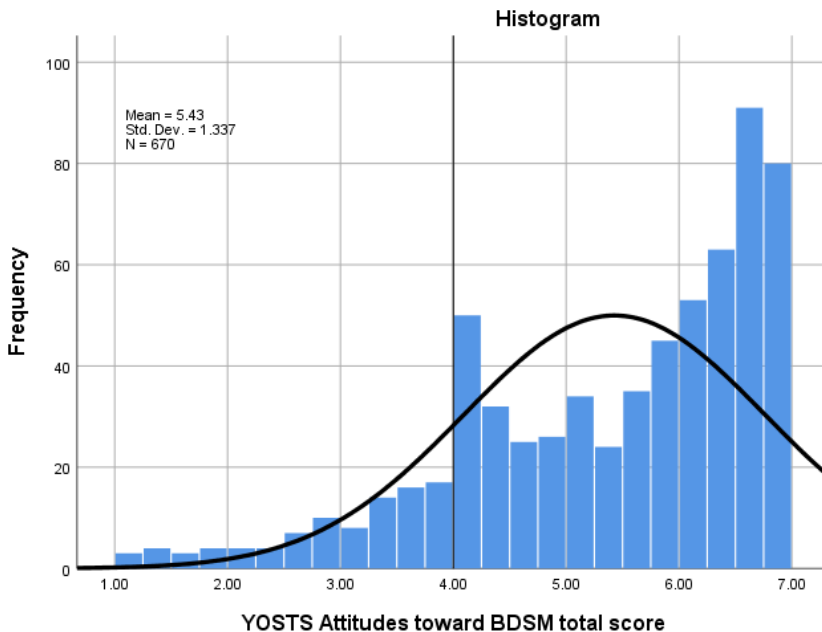


Figure 1: Histogram of AMSM Scores for all participants combined

First, the two MTurk samples were compared and found to not differ on their ASMS scores ($t(587)=-1.53$, ns). Next, university men ($n=81$; Sample 1) were compared to similarly-aged men from the MTurk ($n=61$; Sample 3). There was a significant difference (University Men mean=5.62, $sd=0.97$ versus MTurk same-aged men mean=5.22, $sd=1.24$ $t(111)=2.14$, $p<.05$, partial-eta squared=.03). While this was a significant difference, it was not a strong effect. The university men were, on average, slightly more positive in their ASMS scores relative to the MTurk sample of men of the same age (df were adjusted for unequal variance). The University men were also more homogenous in their ASMS scores (i.e., significantly lower variability). There was no significant difference when the 81 university men (mean=5.63, $sd=0.97$) were contrasted to all 589 MTurk participants (mean=5.40, $sd=1.38$; $t(130)=1.85$, $p<.07$, partial-eta squared=.00). In short, there is some weak evidence that university men, in particular, might be slightly more favorable toward SM than internet-solicited participants.

Table 1 presents the descriptive statistics associated with each sample for the ASMS and its subscales. The overall scale had very high reliability across samples. As well, most of the subscales had good reliability. Aberrantly, the

Lack of Tolerance subscale had low internal consistency for the University Men sample. The Real Life subscale was comprised of two items ($rs\sim\text{low}-.70s$). It is noteworthy that the use of a 2-item scale is not recommended and is a questionable practice (Eisinga, te Grotenhuis, & Pelzer, 2013; Kamakura, 2015).

Subscale intercorrelations for each sample are presented in Table 2. These correlations indicate that most of the subscales overlap with each other strongly or moderately ($rs=\sim.60$ to $.90$) as well as consistently across samples. The exception was the Real Life subscale; given that there were only two items in this scale, the lower intercorrelations with other ASMS subscales was not surprising.

Demographic Group Differences in relation to the Attitudes about Sadomasochism Scale and subscales

Gender and Age differences.

Sample 3 allowed for comparison between men/males and women/females. There were no differences between men/males and women/females on the overall ASMS instrument and no differences on the subscales. As well, there were no differences as a function of age cohort (all $Fs<2.00$ ns).

Sexual Orientation. In Sample 3,

Table 1. Descriptive statistics for the Attitudes about Sadomasochism Scale and subscales for three different samples

	Sample 1		Sample 2		Sample 3	
	University Men N = 81-82	MTurk - no demographics N = 172-190	MTurk Female n = 166-178	MTurk Male n = 200-217	MTurk Total N = 384-400	
TOTAL ASMS	Mean 5.63 5.78 5.70 (0.97) .94	Mean 5.53* 6.05 7.00 (1.42) .97	Mean 5.28 5.76 6.78 (1.51) .98	Mean 5.38 5.65 6.74 (1.22) .96	Mean 5.34 5.70 6.74 (1.36) .97	
Socially Wrong (12 items)	5.80 6.04 7.00 (1.02) .90	5.58 6.12 7.00 (1.52) .96	5.38 5.92 7.00 (1.67) .97	5.53 5.83 7.00 (1.41) .96	5.47 5.92 7.00 (1.53) .96	
Violence (5 items)	5.56 6.00 7.00 (1.43) .92	5.62 6.60 7.00 (1.65) .96	5.54 6.40 7.00 (1.70) .95	5.61 6.00 7.00 (1.43) .94	5.58 6.00 7.00 (1.55) .95	
Lack of Tolerance (4 items)	5.39 5.50 5.25 (1.00) .68	5.19 5.50 4.00 (1.35) .84	5.02 5.25 5.75 (1.51) .88	5.09 5.25 6.25 (1.32) .80	5.07 5.25 6.25 (1.41) .84	
Real Life (2 items) [†]	4.87 5.00 4.00 (1.41) r _s = .74	na [‡]	4.55 4.00 4.00 (1.63) r _s = .76	4.45 4.00 4.00 (1.32) r _s = .63	4.50 4.00 4.00 (1.47) r _s = .70	

Notes:

[†] A two-item scale does not necessarily produce a valid alpha; here, we present the non-parametric Spearman rho correlation between the two items (as suggest by Eisinga, te Grotenhuis, & Pelzer, 2013).

[‡] This is based on an average of the 21 items presented to participants as the last three items were inadvertently omitted

[§] The two items were accidentally omitted from the questionnaire for these participants.

participants were asked to select a sexual orientation label. This allowed for comparison of sexual orientation on the ASMS. The four sexual minority groups (bi/pan $n=35$; gay/lesbian $n=18$, asexual $n=2$, and unknown $n=2$) were amalgamated into one group to compare to those who identified as heterosexual ($n=343$) because of the smaller numbers of participants who identified as a sexual minority. There were significant differences between heterosexual and sexual minority groups for the overall ASMS as well as for each subscale. Inspection of Table 3, which presents statistics associated with these tests, indicates that there was moderate effect size for each test – except for the Real Life subscale – such that the sexual minorities had a significantly higher score (i.e., more favourable) on the various ASMS scales.

Religion. Sample 3 MTurk participants were asked how religious they considered themselves. This religiosity was correlated with the overall ASMS and subscales; the correlations were significant such that those who were the most religious were the most negative regarding SM with the exception of the Real Life scale. While the correlations between religiousness and the ASMS were significant, they were weak – ranging around .25 to .33

(see last column, Table 4). Those who rated themselves on the more religious end of the scale were the least positive toward SM.

Living Locations. Sample 3 MTurk participants were asked in what type of developed environment they lived (urban ($n=121$), rural ($n=72$), or suburban ($n=193$)). These three groups did not differ statistically from each other on the overall ASMS or subscales (all $F_s < 0.80$, ns). There were no differences in the overall ASMS and most subscales as a function of US region of residence, either (all $F_s < 4.50$, ns). There was a significant difference in the Socially Wrong subscale ($F(3,386)=6.46$, $p < .05$, $\eta_p^2=.02$); post hoc analyses suggest that those living in midwestern states were less likely to judge SM as socially wrong compared to the northeastern states ($\bar{x}_{\text{midwestern}}=5.78$ vs. $\bar{x}_{\text{northeastern}}=5.16$) while those living in western or southern states did not differ significantly from either midwestern or northeastern state residents. While this was a significant difference, the partial-eta squared indicates it was an extremely weak effect and given that there were five tests, the significance could be a function of Type I error (i.e., a Bonferroni-type adjustment would require $p < .01$ for significance). This effect is thus not judged as substantive.

Table 2. Intercorrelations among the Attitudes about Sadomasochism Scale Subscales for different samples

	Socially Wrong	Violence	Lack of Tolerance	Real Life
Socially Wrong (12 items)	1	.81**** .89**** .89**** .84****	.72**** .65**** .77**** .62****	.33*** na .56**** .41****
Violence (5 items)		1	.60**** .67**** .69**** .58****	.41**** na .63**** .51****
Lack of Tolerance (4 items)			1	.33** na .43**** .12ns
Real Life (2 items)				1

Notes: **** $p < .0001$; *** $p < .001$; ** $p < .01$; * $p < .05$

Correlations are for University Men ($n=81-82$), MTurk Maureen combined-gender Sample 2 ($n=183-187$), MTurk Women Sample 3 ($n=175-178$), MTurk Men Sample 3 ($n=210-217$)

Table 3. Sexual orientation difference test for the Attitudes about Sadomasochism Scale and subscales for aMTurksample (Sample 3).

	Sample 3		
	MTurk Sexual Minority $n = 57$	MTurk Heterosexual $n = 343$	Test of Difference $t(df)^\dagger$ (partial-eta squared)
	Mean (sd)	Mean (sd)	
TOTAL ASMS	6.22 (0.76)	5.20 (1.38)	(127) 8.12**** (.07)
Socially Wrong (12 items)	6.46 (0.80)	5.31 (1.57)	(142) 8.50**** (.07)
Violence (5 items)	6.43 (0.91)	5.44 (1.60)	(123) 6.70**** (.05)
Lack of Tolerance (4 items)	5.90 (1.04)	4.92 (1.42)	(96) 6.22**** (.06)
Real Life (2 items)	4.44 (1.49)	4.78 (1.92)	(127) 2.07* (.01)

Notes: **** $p < .0001$; * $p < .05$

[†] All tests adjusted for unequal variance. When the large variances are associated with larger group, as is the case here, the significance level will be overestimated. This can reduce the power of the test.

In sum, there were no differences on the ASMS for different ages, genders, or living locations. However, there were differences between sexual orientations such that sexual minorities were more favorable on the ASMS than heterosexual people. There was also an impact of self-rated religiosity with those who were the least religious having more positive ratings on the ASMS.

Construct Validity of the Attitudes about Sadoomasochism Scale and subscales

Semantic Differential Attitudes toward BDSM. We assessed attitudes toward BDSM using a traditional semantic differential-type of measure consisting of 4 aggregated items ($\alpha_{\text{University Men Sample 1}} = .86$ and $\alpha_{\text{MTurk Sample 3}} = .96$). The semantic differential attitude correlated moderately with the overall ASMS ($r_{\text{University Men Sample 1}} = .36$ and $r_{\text{MTurk Sample 3}} = .69$) and with its subscales (see Table 4).

Interest in SM. Five items were included and aggregated to assess interest in SM. Across all three samples, the ASMS correlated moderately with interest in SM such that those with more favorable attitudes expressed greater interest in SM. The Socially Wrong and Lack of Tolerance subscales correlated moderately with interest in SM such that those who

expressed that SM was socially wrong and those who had least tolerance for SM demonstrated the least interest in SM. For the two MTurk samples, the Violence subscale correlated moderately with SM interest but weakly for the University Men sample. The Real Life subscale was also very weakly correlated with SM interest such that those who did not think SM roles represented real life personality characteristics demonstrated greater SM interest.

Knowledge about SM. MTurk Sample 3 participants exhibited weak-to-moderate correlations between the ASMS and Yost's (2010) knowledge of SM scale – ranging from .22 to .39. This was in contrast to the University Men Sample 1 where the correlations were weak between the ASMS and SM knowledge (range: .05 to .22). This difference may be a function of greater variability of attitudes in the MTurk sample.

In sum, the ASMS demonstrates convergent validity as evidenced by moderate correlations between the entire scale and three relevant BDSM measures: overall BDSM attitudes, interest in SM, and knowledge of SM. Most ASMS subscales also correlated moderately with these three BDSM measures. The weaker relationships for university men suggest that the ASMS may not have as much ability

Table 4. Correlations of BDSM constructs and the Attitudes about Sadomasochism Scale and subscales.

	BDSM Semantic Differential opinion (4 items with 1 -5 response scale)		Interest in SM (5 items with 1-7 point response scale)		Yost (2010) SM Knowledge		Religiosity* (1 item with 1 -5 response scale)
	University Men (n=79-80)	Sample 3 MTurk (n=390-400)	University Men (n=79-80)	Sample 2 MTurk (n=182-189)	University Men (n=81-82)	Sample 3 MTurk (n=390-400)	Sample 3 MTurk (n=390-400)
TOTAL A SMS	.36***	.69*****	.50*****	.54*****	.20ns	.39*****	.31*****
Socially Wrong (12 items)	.37***	.70*****	.50*****	.41****	.21ns	.38*****	.33*****
Violence (5 items)	.35**	.69*****	.33**	.47*****	.16ns	.34*****	.25*****
Lack of Tolerance (4 items)	.41****	.58*****	.65*****	.67*****	.22*	.31****	.29*****
Real Life (2 items)	.12ns	.33*****	.19ns	na	.05ns	.22*****	.07ns

Notes: *** $p < .0001$; ** $p < .01$; * $p < .05$

† All tests adjusted for unequal variance. When the large variances are associated with larger group, as is the case here, the significance level will be overestimated. This can reduce the power of the test.

* Spearman's Rho

to differentiate with samples demonstrating more highly positive attitudes (i.e., those samples with restricted range, less variability).

Erotophobia–Erotophilia. As sadomasochism falls within a sexuality-related domain, we assessed some more general measures of comfort with sexuality –erotophobia–erotophilia– as a means of assessing construct validity of the ASMS. Erotophobia–erotophilia is defined as a dimension of personality theorized as a learned disposition to respond to sexual stimuli with negative-to-positive affect and evaluation. Erotophobia–erotophilia is believed to determine avoidance or approach responses to sexual stimuli (Fisher et al., 1988). Table 5 presents correlations of the ASMS with the erotophobia–erotophilia measures.

The relationships between the ASMS and various measures of erotophobia–erotophilia present a consistent picture. In general, the overall ASMS and the various measures of erotophobia–erotophilia correlate moderately-to-strongly. The University men Sample 1 demonstrated the weakest correlations, as well. The Real Life subscale correlated weakly-to-not-at-all with the various erotophobia–erotophilia scales. Of the instruments, the

Sexual Opinion Survey correlated the most strongly with the ASMS and subscales. In general, those with the most positive response to SM were more erotophilic.

Confirmatory Factor Analysis

Yost (2010) asserted that her scale consisted of four factors –Socially Wrong, Violence, Tolerance, and Real Life– based on an initial exploratory factor analysis of 34 items from 213 participants. She then completed a confirmatory factor analysis with the 23 scale items from 258 participants and concluded that the model fit the data well. We conducted a confirmatory factor analysis to assess the factor structure of Yost's ASMS with 462 participants (291 men, 166 women, 3 gender queer, and 2 of unknown genders) who provided complete data for this scale. The fit of the model was not sufficient without modifying the relationships between errors. Using modification indices, error terms were allowed to co-vary between items on different factors if the covariation made theoretical sense (Byrne, 2001; e.g., the items were designated as belonging to different factors but contained the same content such as item 7 'Sadomasochistic activity should be against the law' from the Socially Wrong factor and item 21 'Sadomasochistic activity should be legal, as long as all participants

Table 5. Correlations of sexuality-relevant constructs and the Attitudes about Sadomasochism Scale and subscales.

	Measures of Erotophobia—Erotophilia						
	Sexual Opinion Survey			Sexual Liberalism Scale			Sexual Anxiety Scale
	University Men (n=81-82)	Sample 2 MTurk (n=183-190)	Sample 3 MTurk (n=390-400)	University Men (n=95-96)	Sample 2 MTurk (n=183-190)	Sample 3 MTurk (n=390-400)	University Men (n=94-95)
TOTAL ASMS	.47****	.73****	.72****	.29**	.54****	.58****	.35****
Socially Wrong (12 items)	.46****	.70****	.72****	.29**	.52****	.57****	.34****
Violence (5 items)	.38****	.70****	.62****	.20ns	.48****	.50****	.30**
Lack of Tolerance (4 items)	.45****	.61****	.59****	.31**	.51****	.51****	.35**
Real Life (2 items)	.17ns	na	.34****	.11ns	na	.27****	.07ns

Notes: **** $p < .0001$; *** $p < .01$; ** $p < .01$; * $p < .05$

are consenting adults' reverse coded from the Lack of Tolerance factor). In particular, we allowed eight pairs of error terms to co-vary in order to reach an acceptable model fit.* With these modifications, the model statistics were very similar to that reported by Yost (2010). The model demonstrated acceptable fit to the data: $\chi^2(216) = 951.62$, $p < .001$; incremental fit index, IFI=.93; comparative fit index, CFI=.93; and root mean square error of approximation, RMSEA=.086 [range .080 to .092].

A factor containing two items is often considered as unacceptable (Kamakura, 2015); however, it is arguably acceptable to have a 2-item factor if the construct is narrowly defined, the two items are highly intercorrelated, and neither are correlated with other items from the scale (Yong & Pearce, 2013). The Real Life factor borders on unacceptable; while highly intercorrelated (i.e., $r = .72$; just meeting Yong & Pearce's criteria), these items are also modestly correlated with other items from the instrument (average $r = .35$). Moreover, by deleting the 2-item Real Life factor, model fit to the data was improved significantly based on a chi-square difference test (χ^2

difference = 154.02, $df = 41$). The 3-factor model, with modification allowing 11 pairs of error terms to covary**, demonstrated acceptable fit to the data: $\chi^2(175) = 797.60$, $p < .001$, IFI=.94, CFI=.94, and RMSEA=.088 [range .072 to .094].

In short, our confirmatory factor analysis supported Yost's subscales although we recommend deleting the Real Life subscale.

Discussion

Using large internet samples as well as a small university sample, we present further evidence of the validity of the Attitudes about Sadomasochism Scale (ASMS). The current study found strong internal consistency of the overall scale as well as its subscales and the findings were consistent with much of Yost's (2010) analyses. The instrument and the subscales correlated with other measures of attitudes toward BDSM; specifically, the ASMS related to a general BDSM attitude measure, personal interest in engaging in SM, and self-assessed knowledge of or familiarity with SM (i.e., this last finding conceptually replicating Yost's knowledge analysis).

As well, several measures of erotophobia–erotophilia correlated well with the ASMS and the

*Specifically, item pairs were: 21-7, 12-10, 15-14, 13-8, 16-15, 16-8, 17-11, and 4-3. The item numbers correspond with the item content order presented by Yost (2010, p. 83).

**Specifically, the item pairs were 21-7, 12-10, 15-14, 13-8, 16-15, 16-8, 17-11, 4-3, as well as 3-17, 3-18, and 6-4 (see Yost, 2010, p. 83).

subscales. These findings are consistent with and parallel the relationships of the ASMS with sexual conservatism and attitudes toward lesbians and gay men as presented by Yost (2010). The relationship between religiosity and the ASMS in the current study also conceptually replicated Yost's finding of a moderate relationship between religious fundamentalist beliefs and the ASMS; however, our relationship was more modest – probably because of the use of a one-item measure of religiosity. Additional scale validation was provided by the modest significant difference between sexual minorities and heterosexual participants on the ASMS. Historically, the practice of BDSM was investigated in relation to queer men (e.g., Kamel, 1980; Lee, 1979; Nordling, Sandnabba, Santtila, & Alison, 2006; Weinberg, 1987). Because queer people usually engage in an identity exploration regarding sexuality (Savin-Williams, 2011), they might be more open to non-traditional sexual activities such as BDSM. Alternatively, since queer people are already stigmatized for their sexual orientation, they may be more likely to exhibit more open-minded attitudes toward sexualities considered 'deviant'. Future research would need to specifically examine the psychological roots of differences in attitudes toward BDSM between heterosexual and

sexual minority participants.

The lack of differences between genders, different age groups, and geographical locations may also be interpreted as favorable findings vis-à-vis the utility of the ASMS. While some traditional measures around sexuality occasionally find women to be more sexually conservative than men (e.g., see Rye, Meaney, & Fisher, 2011 illustrating equivocal studies of gender differences/no gender differences in the Sexual Opinion Survey), it is heartening that the ASMS did not demonstrate gender differences, at least not with this large internet sample. Given the lessening of gender differences in sexual attitudes and behaviors over time (Petersen & Hyde, 2011), differences in attitudes toward BDSM would not be expected, especially from those in the US where there may be greater gender empowerment of women. Other cultures or specific subgroups, where there is less gender equity and less empowerment of women, might demonstrate gender differences in attitudes toward SM (Petersen & Hyde, 2010). Equivocally, Joyal and Carpentier (2017) found no gender differences for sadism practices or interest in sadism but did find gender differences for engaging in masochism and desire for masochism such that women had

greater prevalence of this behavior and interest in masochism compared to men. Whether these differences in specific SM practices and interests translate into attitudinal differences toward the practices and/or the practitioners is an area for future investigation.

Lack of difference in ASMS scores as a function of age cohort was consistent with Petersen and Hyde's (2010) meta-analytic finding that age of the participant was not predictive of sexual attitudes (specifically attitudes toward premarital sex, homosexuality, and gay men). Again, an instrument that is not sensitive to the age cohort is desirable. However, a more sensitive assessment of age and consequent relationship with ASMS is warranted.

In terms of living location, one might expect that people from the southern states or Midwest (i.e., 'Bible belt') in the United States would be more socially conservative and, consequently, more negative about controversial sexual topics such as BDSM (e.g., Herek, 1994; White, 2014). However, we did not find ASMS differences based on regional division. It could be that the regions, based on US-census divisions, were too broad. The analysis was also conducted with the state as the grouping variable –but low *ns* per state rendered this test suspectable– and also

demonstrated no differences on the ASMS. In addition to the region, developed settlement living environments (i.e., rural, suburban, or urban residence) demonstrated no differences on the ASMS. In contrast to our finding, Herek (1994) found those living in a rural environment expressed greater sexual prejudice. The difference may be a function of timing of the study (i.e., 25 years between the two studies) or the issues could differ (i.e., attitudes toward lesbians and gay men versus attitudes toward SM).

A consideration for the findings of this study involves those who participated. People who completed the ASMS were those who elected to participate in a sexuality study; those who volunteer for sexuality studies are sometimes different from the study volunteers for non-sexual research (e.g., Bogaert, 1996). Further, internet versus telephone participants were found to have paraphilia differences in about half of the behaviors assessed with the internet sample having greater paraphilia prevalence (e.g., higher levels of masochism, although not sadism; Joyal & Carpentier, 2017). These are design factors that may have impacted the current results.

Theoretically and practically, traditional attitude assessment involves an overall evaluation of an

attitudinal object. General attitude is thought to be underpinned by a cognitive amalgamation of specific beliefs about the attitude object (Ajzen & Fishbein, 1980; Kruglanski & Stroebe, 2005; Petty & Caccioppo, 1980). As Yost's measure consists predominately of belief-based items, the ASMS is best-suited for research where the goal is to determine specific, in-depth belief-based assessment of SM evaluation (i.e., SM as violent or SM as socially wrong). The strong correlation between the ASMS and the 4-item semantic differential attitude measure support the idea that beliefs theoretically determine attitudes (Ajzen & Fishbein, 1980).

Conclusion

The findings presented in this study support the reliability, the validity, and the factor structure of the ASMS, and, consequently, we endorse the use of the ASMS in research. However, the choice of using this instrument would depend on the goals of the research. If a study's goals need specific belief components addressed (e.g., viewing people who engage in SM as sexually violent versus viewing SM as morally reprehensible) or are studying BDSM in depth, then the use of the ASMS is warranted. If a general attitude toward BDSM is all that is necessary in order to address a research aim, then a 4-item semantic differential scale

would be sufficient given the relatively high correlation between the ASMS and the semantic differential assessment (and, fewer items are less taxing on survey participants). Finally, we would recommend omitting the Real Life subscale as it appears less valid and deleting it produced better model fit with the current data.

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