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Discordance between the Sexual Experiences Surveys-Short Forms and the Revised Conflict
Tactics Scales in College Men

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Abstract

Objective: Sexual victimization affects at least one in five college women and up to one in six college men; however, the exact rates of sexual perpetration are difficult to ascertain because of inconsistencies in the measurement of these behaviors. The present study is the first to evaluate the extent to which three commonly used measures of sexual violence (The Sexual Experiences Survey- Short Form Victimization (SES-SFV), The Sexual Experiences Survey-Short Form Perpetration (SES-SFP) and the Revised Conflicts Tactics Scales-Sexual Coercion Subscale (CTS2-SC)) concurred in identifying cases of sexual victimization and sexual perpetration. This is the first study to simultaneously examine victimization and perpetration, provide kappa estimates of discordance, and control for order of survey administration effects.

Methods: Undergraduate men ($N = 397$) completed the study measures in a randomized order.

Results: The SES-SFV identified 109 cases of sexual victimization (27.5% of the sample) while the CTS2-SC identified 164 cases (41.3% of the sample). Results were similar for sexual perpetration. There was no effect of the order of administration on sexual victimization reports. However, there was an order effect for sexual perpetration. When the CTS2-SC was administered first response rates on the CTS2-SC were higher.

Conclusions: These results highlight the lack of precision in the measurement of sexual violence. Conceptually, the SESs should identify a greater number of cases; yet we consistently found that the CTS2-SC identified more cases of sexual violence. We suggest that differences in the instructional cues, internal item structure, and measure structure may account for these differences.

Keywords: sexual assault; rape; perpetration; assessment; measurement

Discordance between the Sexual Experiences Surveys – Short Forms and the Revised Conflict Tactics Scales in College Men

Rape affects at least one in five college women and is the number one cause of posttraumatic stress disorder (PTSD) in civilians (Muehlenhard, Peterson, Humphreys, & Jozkowski, 2017; Breslau et al., 1998). Rates of sexual victimization are similarly high in college men (French, Suh, & Arterberry, 2017). Yet, the exact scope of this problem is difficult to determine due to challenges in measurement; estimates of rape perpetration vary from 4.0 to 53.4% in young men (Mouilso & Calhoun, 2016; Strang & Peterson, 2016). Research that informs the accurate measurement of sexual violence is greatly needed in order to understand the extent of the problem and inform efforts to reduce the public health impact of this widespread phenomenon. As defined by the Centers for Disease Control and Prevention, sexual violence is any form of sexual contact that occurs without consent (Basile, Smith, Breiding, Black & Mahendra, 2014). Sexual violence consists of several forms such as rape (e.g., the use of threats of force, alcohol incapacitation, or force to coerce oral, anal, or vaginal sex), verbal coercion (i.e., the use of verbal strategies to coerce oral, anal, or vaginal sex), and unwanted sexual contact (e.g., groping over clothes; Koss et al., 2007). Although prior research has not produced a consistent definition of sexual victimization/perpetration, we use the term sexual victimization to refer to the experiences of people who have been harmed sexually and the term sexual perpetration to refer to the behavior of those who have harmed others sexually. The goal of this study was to compare reports of sexual victimization and sexual perpetration on commonly used measures of sexual violence: the Revised Conflicts Tactics Scales (CTS2: Straus, Hamby, Boney-McCoy, & Sugarman, 1996), the Sexual Experiences Survey – Short Form Perpetration

(SES-SFP) and the Sexual Experiences Survey – Short Form Victimization (SES-SFV) (Koss et al., 2007) to elucidate effective measurement strategies for sexual violence research.

Lack of Measurement Precision

The field of violence struggles with measurement issues including lack of precision in definitions and thus, measurement tools (Grych & Hamby, 2014; Hamby, 2017a). Indeed, estimates of sexual victimization in men range between 2 and 73% depending on the definitions of sexual victimization and the instrument used (Peterson, Voller, Polusny, & Murdoch, 2010). Estimates of sexual perpetration rates in college men similarly vary widely, ranging from 3.3-68.0% (O'Dougherty Wright, Norton, & Matusek, 2010; Schatzel-Murphy, Harris, Knight, & Milburn, 2009). This problem of precision has been highlighted in research on sexual victimization in college women (Fedina, Holmes, & Backes, 2017) and on sexual victimization rates in other countries. For example, Krahe, Tomaszewska, Kuyper, and Vanwesenbeeck (2014) found that rates of sexual victimization in women in Poland ranged from 8.4 to 57.0%. Estimates ranging this widely obscure true differences related to variation in risk factors vs. variation related to measurement strategy. To wit, after developing a standardized measure, Krahe and colleagues (2015) were able to demonstrate that the prevalence of sexual victimization among Polish women is likely near 30.1%.

Behaviorally Specific Questionnaires: The Sexual Experiences Surveys and the CTS2

The rise of behaviorally-specific questions, such as those used in the Sexual Experiences Surveys and the CTS2, initially revolutionized the assessment of sexual violence, leading to more accurate estimates of the number of individuals affected by rape than those provided by police reports or questionnaires relying on stigmatizing and colloquial language. The SES-SFP and the SES-SFV (collectively, the revised Sexual Experiences Surveys: R-SESs) and the CTS2-

SC (the sexual coercion subscale of the CTS2) assess similar and highly related constructs (Hamby & Grych, 2013). However, the goals of these measures are slightly different, and they arose in different literatures. The precursor to the R-SESs (the O-SES) was developed in college students with the intent of assessing sexual victimization, particularly incidents that met the legal definition of rape. The R-SESs improved the assessment of consent, eliminated heterosexist language, and broadened the range of sexual assault experiences assessed. In contrast, the CTS2 was developed using conflict theory to understand intimate partner violence (IPV) and was revised to include sexual violence as one possible form of IPV (Straus et al., 1996). Thus, the R-SESs focus on one form of violence (sexual violence) that may occur in any social context (stranger, partner, acquaintance) while the CTS2 focuses on the entire range of possible violence experiences in one social context: romantic partnerships.

These unique foci and histories thus create differences in content and structure of the measures. For example, the R-SESs assess a larger range of sexual acts (e.g., oral, anal, or vaginal sex) and tactics (i.e., methods of coercion to obtain sexual acts) than does the CTS2-SC (see Table 1 for an item comparison). In addition to differences in the sexual acts and tactics assessed, consent is operationalized differently in the two measures. The R-SESs use the phrase “without your consent” while the CTS2-SC items do not mention the word consent explicitly but operationalize consent with phrases such as “didn’t want to”. There are also differences in the structure of the measures, particularly the hierarchical ordering of items, the length of items, and the internal structure of the items. Given these differences, one would expect significant overlap, but not a complete correspondence between the two measures. As the CTS2-SC focuses on only sexual assaults between intimate partners, one would expect that the R-SESs would identify a

greater rate of sexual violence by including a larger range of social contexts, sexual acts, and tactics. In contrast, the CTS2-SC may identify a higher rate within samples of coercive couples.

Research Comparing Questionnaires

Comparisons between two validated measures of the same construct (i.e., behaviorally specific questionnaires assessing sexual violence) can be useful for examining how differences in measurement strategy can lead to different rate estimates for different behaviors (Cascardi & Muzyczyn, 2016; DiLillo et al., 2006; Strang, Peterson, Hill, & Heiman, 2013) and the comparative validity of each measure (Hulme, 2007; French et al., 2017). Prior research comparing the CTS2-SC and the SES-SFV found that the CTS2-SC identified a higher rate of sexual victimization than the SES-SFV (73% versus 63%) in women in domestic violence shelters (Moreau, Boucher, Hébert, & Lemelin, 2014). Overall, 80% of the sample reported some type of sexual victimization, and percent agreement was adequate (76.8%); yet the CTS2-SC identified 23 cases (16.7% of the 138 respondents) that the SES-SFV identified as non-victims. This is notable as only sexual violence from partners would be expected to be reported on the CTS2-SC; yet all experiences of sexual violence, including from partners, would be expected to be reported on the SES-SFV. We were unable to identify any prior research that compared the SES-SFP and the CTS2-SC. However, Cook (2002) found that the total scores on the CTS2-SC were three times higher than the O-SES, yet O-SES rape items were far more sensitive than CTS2-SC severe perpetration items. It is unclear whether results for the R-SESs would mirror these findings given the significant differences between the two measures (Koss et al., 2007; Anderson et al., 2017). Strang and colleagues, in a series of studies, highlighted the degree and nature of discrepancies between the O-SES, the SES-SFP, and another measure of sexual perpetration, the Sexual Strategies Scale (Strang et al., 2013; Strang & Peterson, 2016; Strang &

Peterson, 2017). This work suggested that a direct comparison of relevant items and comparative validity research is crucial to clearer understanding.

Thus, assessing the convergent validity of the R-SES's and the CTS2-SC can further clarify the psychometric properties of these measures and their utility in research. Prior research has found very similar, small, correlations comparing the O-SES to another measure of sexual victimization (The Sexual Coercion Inventory), $r = .20$ (French et al., 2017). In a sample of young men, the Sexual Experiences Survey – Long Form Perpetration and the Post-Refusal Persistence Scale were correlated at $r = .52$ (Buday & Peterson, 2015). Together, this research suggests that there may be greater difficulty in accurately capturing the construct of sexual victimization in men than the construct of sexual perpetration.

The Current Study

The current study compared the rates of reported sexual victimization and perpetration in college men by comparing the CTS2-SC to the SES-SFV and the SES-SFP, respectively. This extends the literature on sexual violence measurement by comparing discrepancies in reports of victimization and perpetration in the same sample, using an updated measure of perpetration (the SES-SFP), examining sexual victimization in men, providing kappa estimates of discordance, and by examining whether order of administration impacts rates of reporting. No prior research has compared the CTS2-SC and the R-SESs in a sample of college men, despite college students being the focus of much IPV and sexual violence research. Finally, we also included two questionnaires to assess the differential validity of the R-SESs and the CTS2-SC in identifying cases of sexual violence.

Hypotheses:

1. The CTS2-SC will identify more cases of sexual violence victimization overall than the SES-SFV, consistent with Moreau et al. 2014.
2. The SES-SFV will identify more cases of rape victimization than the CTS2-SC consistent with prior work on the importance of behaviorally specific questions for assessing rape in women (for example, Fisher, 2009). No prior research has examined sexual victimization measurement in college men using these questionnaires.
3. The CTS2-SC will identify more cases of any sexual violence perpetration overall than the SES-SFP; no prior research has compared these two measures.
4. The SES-SFP will identify more cases of rape perpetration than the CTS2-SC extending Cook (2002)'s findings regarding the O-SES and the CTS2-SC.
5. There will be no order effects for sexual victimization (5a) or sexual perpetration (5b). No prior research has controlled for potential effects of the order of administration.
6. Correlations between the measures of sexual victimization (SES-SFV, CTS2-SC) and a measure of trauma symptoms will be of similar strength (6a) as will correlations between the measures of sexual perpetration (SES-SFP, CTS2-SC) and a measure of trait physical aggression (6b) consistent with prior research (French et al., 2017). No Prior research on the psychometric properties of these measures has conducted this type of comparative validity analysis.

Methods

Participants

Participants were 397 college men at a Midwestern University aged 18 or older who completed the SES-SFP, SES-SFV, and CTS2-SC. Participants were mostly heterosexual (88.7%) and White (77.6%); 7.3% identified as African American, 6.5% as Asian/Asian

American, 1.8% as Native American, and 7.1% as Hispanic or Latino. The average age was 21.9 ($SD = 5.0$). This sample has been previously described (Anderson, Cahill, & Delahanty 2017, 2018; Anderson, Wandrey, Klossner, Cahill, & Delahanty, 2017); only men were recruited as sexual victimization is understudied in college men and may have different properties than sexual victimization in college women (e.g., different levels of associated symptoms, gender of perpetrators, etc.: Peterson, Voller, Polusny, & Murdoch, 2010). Further, women were excluded as there are concerns regarding the validity of common sexual perpetration measures in women (Buday & Peterson, 2015).

Measures

The following questionnaires assess most but not all domains of sexual violence; notably these questionnaires do not assess non-contact sexual victimization such as being forced to watch pornography.

Questionnaires assessing sexual violence.

The Sexual Experiences Survey – Short Form Victimization (SES-SFV: Koss et al., 2007). The SES-SFV for men consists of eight items. Five of these are compound, behaviorally-specific items used to assess one's history of sexual victimization experiences. The remaining three items assess the context of sexual victimization. Data from the three follow-up items are not reported here. The compound items begin with a sexual act as a stem and are followed by five sub-items that describe the tactic used to coerce the sexual act. This creates 25 items by crossing each sexual act by each tactic, see Table 1 for an example item. Respondents complete the measure by responding to the number of times they have experienced each item (0, 1, 2, 3+) for two time-frames: beginning at age 14 and until one year ago (prior years') and in the past year. These two time-frames can be combined to create a lifetime score. A response of 1 or

above was coded as having experienced the event. To be consistent with the time-frames of the CTS2-SC, we utilized the past year and lifetime scores in this study. There is good evidence of validity and adequate evidence of reliability for the SES-SFV when scored dichotomously (victimization yes/no) (Anderson, Cahill, & Delahanty, 2016). We did not calculate Cronbach's alpha given that internal consistency is a good measure of reliability for latent constructs but is inappropriate for measures of behavioral experiences (Diamantopoulos, Riefler, & Roth, 2008; Koss et al., 2007). In the case of sexual victimization, there is no latent construct internal to the participant that in and of itself induces sexual victimization given that sexual victimization is ultimately caused by another person (Koss et al., 2007).

To test Hypothesis 2, and based on the recommendations of Koss et al., 2007, we assessed the correspondence between different types of sexual victimization on the SES-SFV and the CTS2-SC. Some items on the SES-SFV did not have a corresponding item on the CTS2-SC; thus, these items were not included. To calculate verbal coercion scores we used items 2a, 4a, 5a, and 7a; these items assess the experience of being verbally pressured to attempt/complete oral sex, or attempt/complete anal sex. To calculate rape victimization scores we used items 2e, 4e, 5e, and 7e; these items assess being physically forced to attempt/complete oral or anal sex. Notably, the SES-SFV as written for men does not assess the experience of being forced to penetrate a women's vagina or being forced to penetrate someone's anus.

The Sexual Experiences Survey – Short Form Perpetration (SES-SFP: Koss et al., 2007). The SES-SFP follows the same format as the SES-SFV; it also consists of compound items involving a sexual act followed by tactics used to coerce the sexual act and three additional contextual items. The SES-SFP contains 7 compound, behaviorally specific items (i.e., 35 total items) that are used to assess history of sexual perpetration. The SES-SFP also uses the same

response format as the SES-SFV (0, 1, 2, 3+) and same time-frames. An example SES-SFP item is, “I had oral sex or made someone perform oral sex on me without their consent by: taking advantage when they were too drunk or out of it to stop what was happening”. To test Hypothesis 4, we calculated category scores (excluding items that had no direct correspondence with the CTS2-SC) to compare the differences between the SES-SFP and the CTS2-SC in assessing different types of sexual perpetration. Thus, to calculate verbal coercion perpetration scores we used SFP items 2a, 4a, 5a, 7a, 3a, and 6a; these items assess the use of verbal pressure to attempt/complete oral, anal and vaginal sex, respectively. To calculate rape perpetration scores we used items 2e, 4e, 5e, 7e, 3e, and 6e; these items assess the use of physical force to attempt/complete oral, anal and vaginal sex, respectively. A response of 1 or above was coded as having experienced the event. There is good evidence of both validity and reliability of the SES-SFP in men (Anderson, Cahill, & Delahanty, 2017; Davis, Gilmore, et al., 2014; Johnson, Murphy, & Gidycz, 2017). As with the SES-SFV, we do not report Cronbach’s alpha for the SES-SFP. There is some debate as to whether sexual perpetration represents an underlying latent construct; however, when the SES-SFP is used to estimate rates of perpetration as in this paper, internal consistency is not a recommended measure of reliability (Koss et al., 2007).

The Revised Conflict Tactics Scales – Sexual Coercion (CTS2-SC: Straus et al., 1996).

We administered the full 78 items of the CTS2 in this study, but only the data from the sexual coercion subscale (7 pairs of items: 14 items total) are reported in this paper. Items from the sexual coercion subscale assess sexual violence in intimate partner relationships; these items are interspersed throughout the CTS2. We used the standard instructions for the CTS2-SC which ask participants to think about different ways that couples settle differences. Each pair assesses both victimization and perpetration for the same behavior; “I did ...” vs. “My partner...” See Table 1

for an example item. Some of these items include both a sexual act and a tactic, and some do not. Items are rated on an 8-point frequency scale (0- never, 1, 2, 4, 8, 15, 25, 99- not in the past year but it did happen before). Responses scored between 1 – 25 were coded as positive for past year, any response greater than zero was coded positive for lifetime. Thus, the CTS2-SC assesses past year and lifetime, and these are roughly comparable to the time frames assessed by the R-SESs. The CTS2 has shown evidence of convergent validity and reliability in previous research (Simpson & Christensen, 2005). We calculated three category scores for the CTS2-SC including only items that were comparable to the SES-SFV or the SES-SFP. To calculate verbal coercion victimization we used item 64, to calculate rape victimization we used item 20. To calculate verbal coercion perpetration we used items 51 and 63, to calculate rape perpetration we used items 19 and 47.

Questionnaires used to assess validity.

Impact of Event Scale-Revised (IES-R: Weiss, 2004). The IES-R was used to assess common post-trauma symptoms; participants were instructed to anchor their reports to a “stressful event”. Participants rated each of 22 possible symptoms such as, “Any reminder brought back feelings about it” for their experiences in the past seven days on a scale from 0 “not at all” to 4 “Extremely” for how distressed or bothered they were. The IES-R has demonstrated good evidence of reliability and validity in past research in a variety of trauma samples (Weiss, 2004). The mean score for this sample was 23.83 (SD = 19.25), ranging from 0 to 83.

The Aggression Questionnaire – Physical Aggression subscale (AQ-P: Buss & Perry, 1992). The Aggression Questionnaire-Physical Aggression subscale (AQ-PA) is a self-report measure of trait physical aggression towards others. This subscale contains 9 items, such as, “I have threatened people I know” that are rated on a scale from 1 (extremely uncharacteristic of

me) to 5 (extremely characteristic of me). In the present sample the mean AQ-PA score was 19.34 (SD = 6.52, range 8.0 - 40.0), Cronbach's alpha = .76. The AQ has demonstrated good evidence of reliability and validity in past research, including with college students (Buss & Perry, 1992).

Procedures

Data were collected between September 2012 and December 2013 for an online study on "Men's Behavior in Relationships." Data were collected anonymously through the website Qualtrics. Participants signed up and received credit through the experiment management system Sona. Participants completed questionnaires in a randomized order. All procedures were approved the first author's Institutional Review Board.

Results

Data Cleaning

Any participant who completed at least one item on each the SES-SFV, SES-SFP, and the CTS2-SC was included. Missing data were minimal; nearly all participants (~95%) completed at least 80% of each of the study measures. Missing data were assumed to be the modal response (0) for measures of violence. For the AQ-PA and IES-R, participants who did not complete at least 80% of the items were excluded; two participants' IES-R scores were excluded for this reason. For participants who skipped items, scores were pro-rated. The skewness and kurtosis of the variables were within acceptable limits (Tabachnick & Fidell, 2007).

Descriptive Results

Victimization. For the lifetime time-period, the SES-SFV identified 109 cases of sexual victimization for a rate of 27.5%. More specifically, the SES-SFV identified 43 cases of verbal coercion and 55 cases of rape. The CTS2-SC identified 164 cases of sexual victimization for a

rate of 41.3%. The CTS2-SC identified 162 cases of verbal coercion and 26 cases of rape. Including both measures, the overall rate of sexual victimization was 52.4%.

Perpetration. For the lifetime time-period, the SES-SFP identified 96 cases of sexual perpetration for a rate of 24.2%. Specific to the type of sexual perpetration, the SES-SFP identified 42 cases of verbal coercion and 51 cases of rape perpetration. The CTS2-SC identified 169 cases of sexual perpetration for a rate of 42.6%. The CTS2-SC identified 167 cases of verbal coercion and 15 cases of rape. Including both measures, overall rate of sexual perpetration was 51.4%.

Sexual Victimization Results

We computed cross-tabulations and chi-squares to test the null hypothesis that there was no relationship between rate of victimization/perpetration and the measure of sexual violence used. We calculated percent agreement (concordance between measures) within the cross-tabulations consistent with other research on violence discrepancies (Cascardi & Muzyczyn, 2016). Discordance or disagreements between the two measures (i.e., CTS2-SC yes/R-SES no; or CTS2-SC no/R-SES Yes) are the inverse of percentage agreement - computed by dividing the number of cases where the questionnaires disagree by the total number of cases (397). We used McHugh (2012)'s guidelines for interpreting kappa.

Hypothesis 1: Comparison of Dichotomous SES-SFV and CTS2-SC Lifetime Scores.

Percent agreement was 64.0% (i.e., 254/397) for lifetime sexual victimization, see Table 2. The rate of discordance was statistically significant, $\chi(1) = 20.81, p < .001$, indicating there is a relationship between rate of sexual victimization and measure used. Further, kappa was .22, indicating minimal agreement when adjusting for chance agreement. We repeated these analyses for the past-year timeframe. Results were very similar; percent agreement was 67.5% (i.e.,

268/397) for past-year sexual victimization, and the rate of discordance was statistically significant $\chi(1) = 22.55, p < .001, \text{kappa} = .21$.

Hypothesis 2: Direct comparison of SES-SFV and CTS2-SC Verbal Coercion and Rape Victimization Items for Lifetime. To more directly compare the two measures, we next analyzed specific types of sexual victimization. To assess history of verbal coercion (use of verbal pressure to obtain oral or anal sex: see measures, Table 1) we compared four items from the SES-SFV with one item from the CTS2-SC. To assess rape victimization through the use of physical force to obtain oral or anal sex, we compared 4 SES-SFV items to 1 CTS2-SC item (see measures). Thus, these analyses do not use the traditional scoring procedures of either measure and instead use fewer, but only directly comparable, items.

Coercion victimization results. The SES-SFV identified 35 participants who experienced coercion victimization whereas the CTS2-SC identified 65 participants. The SES-SFV identified 21 participants that the CTS2-SC did not; the CTS2-SC identified 51 participants that the SES-SFV did not for a total of 72 discordant cases. There was concordance for 14 participants endorsing verbal coercion victimization (SES-SFV yes/ CTS2-SC yes), and for 311 participants endorsing no verbal coercion victimization (SES-SFV no/CTS2-SC no). Percent agreement was 81.7% (i.e., 325/397); the rate of discordance was statistically significant, $\chi(1) = 15.65, p < .001$. Kappa was .19 indicating no reliable agreement after adjusting for chance.

Rape victimization results. The SES-SFV identified 23 participants who experienced rape victimization whereas the CTS2-SC identified 14. The SES-SFV identified 15 participants that the CTS2-SC did not; the CTS2-SC identified 6 cases that the SES-SFV did not for a total of 21 discordant cases. There was concordance for 8 participants endorsing rape victimization (SES-SFV yes/ CTS2-SC yes) and for 368 participants who did not endorse victimization (SES-

SFV no/CTS2-SC no). Percent agreement was 94.7% (i.e., 376/397) for rape victimization. The rate of discordance was statistically significant, $\chi(1) = 70.11, p < .001$. Kappa was .44 indicating a weak level of agreement.

Sexual Perpetration Results

Using the same strategy as the sexual victimization analyses, we calculated percent agreement within dichotomous cross-tabulations.

Hypothesis 3: Comparison of Dichotomous SES-SFP and CTS2-SC Lifetime Scores.

Percent agreement was 64.0% (i.e., 254/397) for lifetime sexual perpetration, see Table 2. The rate of discordance was statistically significant, $\chi(1) = 22.78, p < .001$, indicating a relationship between measure used and rate of perpetration. Further, kappa was .22, indicating minimal agreement when adjusting for chance. We repeated this analysis for the past-year timeframe. Results were very similar, percent agreement was 70.0% (i.e., 278/397) for past-year sexual perpetration; this rate of discordance was statistically significant, $\chi(1) = 44.73, p < .001$, kappa = .27.

Hypothesis 4: Direct Comparison of SES-SFP and CTS2-SC Coercion and Rape Perpetration Items for Lifetime. Similar to our strategy for victimization scores, we next compared participants by category of sexual perpetration, including only the most comparable items. Thus, we compared items from the SES-SFP verbal coercion category (6 items) to the CTS2-SC verbal coercion category (2 items); similarly, we compared SES-SFP rape items (6 items) to CTS2-SC rape items (2 items).

Coercion perpetration results. Using these more conservative analyses, the SES-SFP identified 29 participants who reported verbal coercion perpetration whereas the CTS2-SC identified 136 participants. The SES-SFP identified 10 participants that the CTS2-SC did not; the

CTS2-SC identified 117 cases that the SES-SFP did not for a total of 127 discordant cases. There was concordance for 19 participants endorsing verbal coercion perpetration (SES-SFP yes/CTS2-SC yes), and for 251 participants not endorsing verbal coercion perpetration (SES-SFP no/CTS2-SC no). Percent agreement was 68.0% (i.e., 270/397) for coercion perpetration; the rate of discordance was statistically significant $\chi(1) = 13.58, p < .001$. Kappa was .13 indicating no reliable agreement after adjusting for chance agreement.

Rape perpetration results. The SES-SFP identified 16 participants positively for rape perpetration whereas the CTS2-SC identified 13 participants. The SES-SFP identified 9 participants that the CTS2-SC did not; the CTS2-SC identified 6 participants that the SES-SFP did not for a total of 15 discordant cases. There was concordance for 7 participants endorsing rape perpetration (SES-SFP yes/CTS2-SC yes) and for 375 participants not endorsing rape perpetration (SES-SFP no/CTS2-SC no) for rape perpetration. Percent agreement was 96.2% (i.e., 382/397). This discordance was statistically significant, $\chi(1) = 86.23, p < .001$, kappa was .46 indicating a weak level of agreement.

Hypothesis 5a and 5b: Test of Order Effects

We next tested whether completing the CTS2-SC first (or not) affected the pattern of concordance/discordance. Thus, we compared the four possible patterns of discordance/concordance (both negative, R-SES positive/CTS2-SC negative, R-SES negative/CTS2-SC positive, both positive) by whether the R-SESs or the CTS2-SC were completed first using a chi-square of the complete 2x4 matrix. There was no effect of order on the pattern of discordance for lifetime victimization reports, $\chi^2(7) = 1.67, p = .65$. We repeated this analysis for lifetime perpetration reports. There was an order effect for perpetration reports,

$\chi^2(7) = 8.16, p = .04$, Cramer's $V = .14$ (medium effect size), such that when the CTS2-SC was administered first, there were more positive responses on the CTS2-SC than the SES-SFP.

Hypothesis 6a and 6b: Validity analyses

Victimization. One-way ANOVAs and Tukey's HSD tests assessed whether IES-R symptoms varied among the four possible patterns of discordance on the SES-SFV and CTS2-SC (both agree no, $n = 221$: SES-SFV yes/CTS2-SC no, $n = 13$: SES-SFV no/CTS2-SC yes, $n = 131$: both agree yes, $n = 30$) for assessing verbal coercion and rape, respectively. Results were significant for verbal coercion, $F(3, 391) = 5.75, p = .001$ such that participants in the SES-SFV no/CTS2-SC yes, and in the SES-SFV yes/CTS2-SC yes groups reported more trauma symptoms than those in the SES-SFV no/CTS2-SC no group. We repeated this analysis for rape cases; results were not significant.

We also computed Spearman's rho rank correlations for IES-R, SES-SFV lifetime dichotomous, and CTS2-SC lifetime dichotomous scores. IES-R scores were slightly more strongly correlated with CTS2-SC, $r(395) = .18$ than SES-SFV scores, $r(395) = .13, p < .01$; however, these values were not significantly different from one another, $z = .72, p = .47$.

Perpetration. Similar analyses assessed whether AQ-PA scores varied among the four possible patterns of discordance on the SES-SFP and the CTS2-SC (both agree no perpetration, $n = 218$: SES-SFP yes/CTS2-SC no, $n = 12$: SES-SFV no/CTS2-SC yes, $n = 137$: both agree yes, $n = 30$). Results were significant for verbal coercion, $F(3, 393) = 3.45, p = .02$ such that participants in the SES-SFV no/CTS2-SC yes, and in the both yes groups reported significantly higher trait physical aggression than those in the both no group. Results were not significant for rape perpetration cases.

Finally, we computed Spearman's rho rank correlations for AQ-PA, SES-SFP lifetime, and CTS2-SC lifetime scores. AQ-PA scores were significantly correlated with SES-SFP scores $r(397) = .16, p < .0001$ but not CTS2-SC scores, $r(397) = .10, p = .06$; however, these correlation values were not significantly different from one another, $z = .86, p = .39$.

Discussion

In spite of the fact that rape victimization is the number one cause of PTSD in civilians (Breslau, 1998) researchers have struggled to accurately estimate the scope of sexual violence due to challenges in measurement. This study compared three widely used measures of sexual violence to assess how differences in measurement strategy can affect reported rates of sexual violence victimization and perpetration. We found broad discrepancies in reported rates of both sexual victimization and sexual perpetration when comparing the R-SESs to the CTS2-SC. Measurement differences contribute greatly to variability in the reported rates of sexual violence (Peterson et al., 2011; Fedina, Holmes, & Backes, 2017); in this study estimates ranged between 24.2 to 51.4% depending on the measure. This suggests that even very small, subtle differences in wording can change endorsement rates (Hamby & Koss, 2003). Yet, prior research has failed to systematically assess measurement differences, and the type of comparative measurement research presented in this paper is uncommon. Indeed, this is the first study we are aware of to examine victimization and perpetration simultaneously, include a focus on sexual victimization in men, examine potential order effects, and provide kappa estimates of discordance in relation to the measurement of sexual violence in college men.

Victimization Findings

Consistent with Hypothesis 1, we found that the CTS2-SC identified more cases of sexual victimization in college men than the SES-SFV. For the majority of cases identified positively by

either the SES-SFV or the CTS2-SC, there was discordance between the two measures as to whether the participant had experienced sexual victimization or not. Although this overall pattern of discordance (36%) is consistent with prior research (Cook, 2002; Moreau et al., 2014), it is surprising nonetheless. Further, our kappa results suggest that even in the best case (the assessment of rape - Hypothesis 2), the level of agreement between the SES-SFV and CTS2-SC was weak. It is unclear whether the observed discordance rates represent false negatives on the SES-SFV, false positives on the CTS2-SC (which prior research has highlighted as a problem for some CTS2 subscales, see Hamby, 2017b), or a combination of these issues. Our follow-up validity analyses (Hypothesis 6a) indicate that it is unlikely that the cause is solely false positives - the CTS2-SC verbal coercion items were associated with elevated rates of trauma symptoms in participants who responded affirmatively to these items. Rather, these results suggest that, although the number of tactics and sexual acts assessed is important, structural differences such as item order (rather than item content) may be equally important in influencing response rates.

Perpetration Findings

In testing Hypotheses 3 and 4, we found the same pattern of results for sexual perpetration: the CTS2-SC identified more cases of sexual perpetration than the SES-SFP with large discrepancies as to whether participants had a history of sexual perpetration (either the SES-SFP or the CTS2-SC was positive, but not both). Interestingly, the SES-SFP only identified three more cases of rape than the CTS2-SC when restricting to directly comparable items (Hypothesis 4). This was somewhat surprising given prior research that found the O-SES identified approximately 3.5 times the number of severe perpetration cases as the CTS2-SC (Cook, 2002); we hypothesize this difference is related to our more restrictive analysis using only comparable items. This type of well-controlled comparative research is critical for isolating

the causes of discordance between measures (see also, Strang & Peterson, 2017). Indeed, this work conceptually replicates Strang et al., (2013) using a different set of measures to assess sexual perpetration, also finding broad discrepancies between measures designed to assess the same construct. These challenges are not limited to the CTS2-SC or the R-SESs.

We also found an order effect for perpetration response rates (Hypothesis 5b). When the CTS2-SC was administered first, participants endorsed more perpetration experiences on the CTS2-SC than the SES-SFP. Why we observed an order effect only for sexual perpetration is unclear. Perhaps participants who reported an experience on the CTS2-SC thought that there was no need to report it again on the SES-SFP. Alternatively, interview research has demonstrated that some participants find the length of SES-SFP sub-items a and b (verbal coercion items) confusing and thus do not endorse them (Strang & Peterson, 2017). Combined with our validity correlations (Hypothesis 6b), this suggests that the SES-SFP and CTS2-SC may identify different subsets of people who perpetrate sexual violence.

Possible Explanations and Future Research

The degree of imprecision identified in this study is alarming for the science of sexual violence. The observed patterns of discrepancy can be potentially explained in two ways: differences in social context and differences in structure.

Although the CTS2-SC addresses fewer social contexts, the instructions' cues to focus on romantic partners may serve to promote more accurate responding by cueing participants to report cases they may have otherwise disregarded (Fisher, 2009; Aguilar, Mahapatra, Busch-Armendariz, & Dinitto, 2016). Given stereotypes about sexual violence in relationships, particularly myths that a romantic partner cannot be raped (Ferro, Cermele, & Saltzman, 2008), it

may be that this type of cue is needed to produce accurate responses. Thus, without this cue, participants may have a “partner exception” in mind when completing the R-SESs.

Alternatively, the structure of the CTS2-SC may explain these findings. First, the internal item structure of the CTS2-SC places the tactic first, which has been found to increase reporting (Abbey, Parkhill, & Koss, 2005); the R-SESs, in contrast, place the sexual act first. The order of items is important in influencing endorsement rates. Ramirez and Straus (2006) found higher rates of intimate partner violence by administering items in a randomized order rather than a hierarchical sequence. This effect was most pronounced for the most stigmatized behavior; reported rates of sexual violence nearly doubled (24.4 vs. 40.5%). Second, the overall structure of the CTS2 places items in a non-hierarchical order such that severe items are randomized throughout the measure which increases reporting; in contrast, the R-SESs are organized in a hierarchical fashion building to the most severe items. Third, research suggests that the response format of the CTS2-SC, which includes a larger frequency range than the R-SESs, may encourage greater responding (DiLillo et al., 2006; Aguilar et al., 2016). Fourth, the instructional text for the CTS2-SC frames disagreements, conflict, and fights as a normal and inevitable part of relationships. This normalization of maladaptive behavior (for the purposes of the questionnaire) may facilitate greater reporting of sexual violence. Differences in the way consent is operationalized may also be a factor, as has been reported in other perpetration measurement research (Strang et al., 2013). Finally, the CTS2-SC may have less heterosexist bias than the SES-SFV when used to assess sexual victimization in men. There are no items on the SES-SFV that assess being forced to penetrate another person. While the CTS2-SC items are more ambiguous in their descriptions of sexual activity, the use of the term "sex" may allow male respondents to disclose these types of experiences. In sum, there are several possible

explanations for the discrepancies we found, and we highlight these explanations as hypotheses to be tested in future research. Echoing Strang and colleagues, we strongly suggest further research to identify best practices for measuring sexual violence perpetration.

Limitations

This study used a convenience sample of college men lacking in racial/ethnic diversity. No construct validity interviews have been conducted regarding sexual victimization in men, and thus, it is unclear how young men interpret the SES-SFV and CTS2-SC victimization items and whether some responses may include false positives. This is an important area for future research as this study suggests sexual victimization is much more common in men than previously thought (French et al., 2017).

Research Implications

Research designed to identify the best practices in item content is recommended, specifically with a focus on balancing the degree of behaviorally specific language needed for accuracy while minimizing confusion and participant fatigue. The CTS2-SC items are much shorter and present the tactic first (in contrast to the R-SESs), and this difference in item structure may be related to the discrepancies identified here. However, to our knowledge, there are no test-retest reliability data available on tactic first versions of the R-SESs, and we recommend this as a necessary area for future research. We also recommend researchers randomize the order of items to create a non-hierarchical order. We recommend construct validity research, particularly studies that include interview components (e.g., Strang & Peterson, 2017). This type of research is under-appreciated, yet crucial to ensuring that our assessments correctly identify cases. We recommend establishing research networks, in the model suggested by Follingstad and Bush (2014) to collectively address the set of research questions raised here

to maximize the efficient use of resources. Further, we suggest further comparative research use some of the quantitative tools of comparison utilized here such as kappa estimates, to more precisely highlight the degree of discordance. Perhaps especially in the area of sexual violence, it is essential for both scientific integrity and for maintaining the trust of the public to ensure that sexual violence cases are correctly identified.

Clinical and Policy Implications

Our research suggests that clinical work using these (and related) measures of sexual violence may inaccurately estimate the number of cases of sexual violence. Thus, those in clinical practice are encouraged to use interview techniques in addition to multiple, standardized questionnaires to identify cases. For those engaging in prevention work, the use of behavioral and analog assessments such as virtual reality paradigms and vignette assessments (Davis, Parrott, et al., 2014; Jouriles, Simpson Rowe, McDonald, Platt, & Gomez, 2011) is recommended as helpful supplements to standardized questionnaires to assess risk related to sexual victimization and sexual perpetration. Policies which support basic, as well as applied science, are important to answer the types of methodological questions explored here.

Conclusions

The present study underscores the vast differences in the number of sexual violence cases identified by the most commonly used measures of sexual victimization and sexual perpetration. This highlights the lack of precision in the field of sexual violence, yet simultaneously, suggests several areas for future research that may illuminate solutions to this problem.

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Tables

Table 1

Direct Comparison of the Items Used to Assess Sexual Victimization by Verbal Coercion

Revised Conflict Tactics Scale Item	Sexual Experience Survey-Short Form Items
64. My partner did this to me. [paired with this item: I insisted my partner have oral or anal sex (but did not use physical force)].	<p>2a. Someone had oral sex with me or made me have oral sex with them ...</p> <p>4a. A man put his penis into my butt, or someone inserted fingers or objects...</p> <p>5a. Even though it didn't happen, someone TRIED to have oral sex with me, or make me have oral sex with them...</p> <p>7a. Even though it didn't happen, a man TRIED to put his penis into my butt, or someone tried to stick in objects or fingers...</p> <p>†without my consent by: Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I know were untrue, or continually verbally pressuring me after I said I didn't want to.</p>

†this clause is repeated in the ellipses for items 2a-7a.

Table 2
Patterns of Lifetime Discordance for the SES-SFV and SES-SFP compared to the CTS2-SC.

		CTS2-SC		Total
		No	Yes	
Victimization Results				
<u>SES-SFV</u>	No	189	99	288
	Yes	44	65	109
Total		233	164	397
<hr/>				
Perpetration Results				
		CTS2-SC		Total
		No	Yes	
<u>SES-SFP</u>	No	193	108	301
	Yes	35	61	96
Total		228	169	397

Note. SES-SFV = Sexual Experience Survey-Short Form Victimization, SES-SFP = Sexual Experiences Survey-Short Form Perpetration, CTS2-SC = Revised Conflict Tactics Scales-Sexual Coercion Subscale