

ABSTRACT

Employing a natural language processing approach, we analyzed textual content derived from publicly-available athlete victim impact statements (VIS) from the Larry Nassar trial ( $n = 111$ ) to examine psychosocial responses to sexual violence. To explore potential differences in a non-sports context, we conducted similar analyses on a sample of #MeToo tweets ( $n = 45,848$ ). Our research focused on the semantic content of VIS, including positive and negative affect, power and trust dynamics, well-being, and post-traumatic growth. We hypothesized that athletes' reactions to sexual violence would be more likely to contain language related to power and trust. Traditional null-hypothesis significance testing and network analyses were used to identify the psychosocial indicators unique to sexual violence disclosures in a sports context. Results indicated differential use of language related to negative affect, trust, power dynamics, and post-traumatic growth in sports versus non-sports contexts. We discuss clinical, practical, and policy-based implications for risk reduction and intervention.

## Power and Trust Dynamics of Sexual Violence:

### A Textual Analysis of Nassar Victim Impact Statements and #MeToo Disclosures on Twitter

Many forms of sexual violence, whether harassment, abuse, or rape, permeate all levels of sport, especially at the elite level (Marks, Mountjoy, & Marcus, 2012). Although prevalence rates of sexual violence are difficult to accurately assess, some researchers have suggested as many as one in three elite female athletes have suffered some form of sexual violence (Leahy, Pretty, & Tenenbaum, 2002). Despite the suggestion that being an athlete is a protective factor (the “sport protection hypothesis”; Fasting, Brackenridge, & Sundgot-Borgen, 2003), rates of sexual violence against female athletes exceed U.S. population estimates of childhood sexual abuse (Finkelhor, Shattuck, Turner, & Hamby, 2014). Extant research on sexual abuse in sports has primarily focused on coaches as perpetrators (e.g., Fasting & Brackenridge, 2009; Fasting, Brackenridge, Miller, & Sabo, 2008), not surprising given that sexual violence is often committed by individuals in positions of power and authority across a wide variety of contexts (e.g., Brackenridge, 2001; Watts & Zimmerman, 2002).

Unfortunately, literature on athletes’ psychosocial experiences and reactions to abuse (e.g., affective response, power, trust, well-being) is nearly non-existent. For example, an extremely recent systematic literature review on this topic only yielded seven studies for inclusion and concluded that disclosure research in naturalistic settings is limited by issues related to victim silencing and blaming, as well as, interpersonal concerns with the consequences of disclosing (Bjørnseth & Szabo, in press). In fact, the International Olympic Committee recently published a consensus statement calling for empirical research and prevention strategies to specifically address power differences as causes of both abuse and non-disclosure (Mountjoy et al., 2016). Moreover, studies that do address sexual abuse in sport do not often include the

lived experience, psychosocial reactions to, or well-being outcomes of victims themselves (e.g., Fasting et al., 2003; Leahy et al., 2002; Parent, 2011; Vertommen, Kampen, Schipper-van Veldhoven, Uzieblo, & Van Den Eede, 2018). Further, these types of experimental studies may not adequately capture experiences as they occur naturalistically (e.g., Brackenridge & Kirby, 1997; Kirby, Greaves, & Hankivsky, 2002; Swingle et al., 2016). This paper's primary goal is to address these limitations by examining the psychosocial reactions to, and affective responses of, sexually abused athletes' real-world disclosures of their personal experiences as victims of sexual violence. Additionally, we examine whether issues of power and trust are evident in these disclosures, issues suggested by the IOC as important to understand (Mountjoy et al., 2016), yet absent from the literature.

The recent and highly publicized legal process brought against Dr. Lawrence G. Nassar by over 300 female gymnasts, dancers, volleyball players, and others underscores how power and authority can be misused against female athletes. Nassar, the former United States of America Gymnastics (USAG) and Michigan State University (MSU) sports physician, molested hundreds of female athletes over more than two decades. Because team physicians are believed to play an integral role in preventing and reporting sexual abuse (Marks et al., 2012), sexual abuse by a trusted authority figure can be particularly concerning and hard to identify. To date, little research has examined the prevalence of sexual abuse perpetrated by sports physicians or athletes' psychosocial reactions to such sexual victimization. Additionally, it is still unclear if the antecedents and the consequences of sexual violence in the athlete-sport physician relationship have distinctive characteristics as compared to sexual abuse that occurs in other non-sports contexts. The current paper addresses these gaps by examining the psychosocial reactions and experiences of female athletes abused by Larry Nassar. To do so, we use natural language

processing (NLP) techniques (Crossley, Kyle, & McNamara, 2017) to characterize athletes' disclosures of sexual violence perpetrated by a powerful figure in a real-world sports context. Using network analysis, we identify relationships between attitudes and affective reactions in these narratives characteristic of sexual abuse in this sports context. To examine how sport-related sexual violence may differ from other contexts, we compare the Nassar-related first-person narrative accounts with disclosures of sexual violence from the general population on Twitter during the height of the #MeToo movement. While this strategy may not be ideal, we use this comparison to inform additional analyses that further unpack athletes' experiences of sexual abuse perpetrated by powerful individuals. We conclude the paper by identifying prevention strategies that may reduce risk and make suggestions for future research.

### **Sexual Violence in Athletics**

Childhood sexual abuse is most often perpetrated by an emotionally close individual in a position of power or authority over the child (Paine & Hansen, 2002). Beyond power, processes that establish and maintain trust across relationship levels allow sexual abuse to transpire without consequence for the abuser (Cense & Brackenridge, 2001; Nielsen, 2001). In sports, coaches, trainers, physical therapists, or doctors are in powerful positions and engender trust. In one example, 98% of sexual abusers in sports were coaches, teachers, or instructors ( $N = 159$ ; Brackenridge, Bishopp, Moussalli, & Tapp, 2008). Elite athletes are also at a greater risk for experiencing sexual violence, especially younger athletes, due to the power differential between athlete and coach, and in relation to developmental processes (Brackenridge & Kirby, 1997).

In women's elite sports, risk factors for sexual abuse include a clear power differential linked to sexism. For example, unequal status between athlete and coach, coach's reputation, and knowledge inequity increase abuse risk (Fasting & Brackenridge, 2009). Female athletes' risk is

heightened as many powerful positions in sports are occupied disproportionately by men (Burton & Leberman, 2017). In 2014, less than half of women's collegiate teams were coached by women and 11% of athletic departments had no female representation in their administrative structure (Acosta & Carpenter, 2014). These issues are exacerbated by power as elite female athletes are dependent upon the ethical and responsible behavior of trusted, powerful individuals as they work to meet their athletic goals under high physical and mental demands.

Power and trust dynamics emerge as significant factors in episodes of reported sexual abuse in sports. For example, perpetrators engage in "grooming processes" which establish trust between coach and athlete and create communal respect for coaches (Brackenridge et al., 2008; Cense & Brackenridge, 2001). Grooming processes lead to situations in which a powerful and trusted adult may make unwanted sexual advances and the athlete can either reject those advances and perhaps lose athletic opportunities or succumb to retain their position or status (Brackenridge et al., 2008; Cense & Brackenridge, 2001). This intersection between trust, power, and predatory sexual behavior places female athletes at increased risk for sexual abuse, especially very young athletes (Brackenridge, 2001; Gervis & Dunn, 2004; Marks et al., 2012), and may facilitate situations that shelter abusers (Brackenridge, 2001; Brackenridge et al., 2008; Fasting et al., 2008). Perhaps for these reasons, sexual violence against athletes often occurs in places familiar to both the abuser and the abused (Brackenridge et al., 2008). Taken together, these factors make identification and impact in sports distinct from other contexts.

### **Psychosocial Impact of Sexual Violence Disclosures in Sports**

Sexual violence has many long-term effects on a survivor's health and social relationships, yet research specifically addressing outcomes for athletes is woefully absent. In non-sports contexts, women who experience childhood sexual abuse report lower self-esteem,

poorer coping skills, poorer interpersonal skills, and higher risks of suicide, eating disorders, and posttraumatic stress disorder (e.g., McCauley et al., 1997; Mullen, Martin, Anderson, Romans, & Herbison, 1996). Yet, reactions to sexual abuse sometimes include positive outcomes such as resilience (Wilson, 2010). This is reminiscent of post-traumatic growth (PTG; Tedeschi & Calhoun, 2004) in which stressful events may catalyze meaningful and positive changes in one's life (e.g., increased positive self-views, a changed life perspective, spiritual changes, improved interpersonal relationships, and increased life appreciation). The sport protection hypothesis (Fasting et al., 2003) posits that the unique aspects of sport participation (e.g., teammates, tradition, challenge) may provide protection against negative outcomes of sexual abuse characteristic of other contexts (Simon, Smith, Fava, & Feiring, 2015). As such, we also tested this hypothesis by examining resiliency indicators in athlete disclosures of sexual violence.

Among the few investigations examining athletes' psychosocial reactions to sexual violence, three key emotions have been documented: guilt, fear, and shame (Cense & Brackenridge, 2001). These emotions have been related in that athletes' often do not recognize that abuse was not their fault (Cense & Brackenridge, 2001). Similarly, athletes fear losing an influential person (i.e., an abuser), losing opportunities to succeed in their sport, and fear of their accusations being dismissed or not believed (Cense & Brackenridge, 2001). Although these emotional reactions share similarities with emotional reactions in a non-sports context (e.g. fear and shame; DiMauro & Renshaw, in press), no studies have specifically compared affective reactions to sexual abuse in sports and non-sports contexts or with respect to power and trust.

Like other victims, athletes are reluctant to report sexual abuse. The conundrum is clear: athletes may be less likely to identify the abusers who have been entrusted with their care and well-being because they are both trusted and powerful and because this identification often has

negative consequences (Marks et al., 2011; Orchowski & Gidycz, 2012; Summit, 1983). Given the significant psychosocial barriers to disclosure and the compromised role an abuser can play (abuser and mandatory reporter), a systems perspective (c.f., Bronfenbrenner & Morris, 1998; Eiler, Kallen, & Richardson, 2017) is needed to inform new policies, procedures, and plans.

Unfortunately, current procedures have not been effective. Sports organizations often minimize and trivialize victims, blame them for their abuse, and challenge their credibility (Parent, 2011), harming those dependent on organizational and structural safety (Smith & Freyd, 2014). Understandably, these practices have limited studies of athletes' reactions to abuse, however, understanding the psychosocial experiences of athletes who have disclosed sexual violence may assist the stakeholders charged with protecting them.

### **The Current Study**

Little is known about athletes' psychosocial reactions to sexual abuse by a sports physician and whether affective reactions to abuse are linked to the unique power and trust dynamics that characterize this relationship and sports more generally. We expect that, to the extent that athletes' psychosocial reactions are detectible in testimonial disclosures of sexual violence, athletes will be more likely to report attitudes and affective reactions linked to power and trust than in other contexts. The athletic context may also confer some benefit to athletes in their ability to engage in resilient coping to these types of traumatic experiences. Here, we posit that sports participation may increase the likelihood that disclosures of sexual abuse experiences will show greater evidence of resilience (i.e., well-being, post-traumatic growth). We argue that to best understand and improve processes that facilitate the disclosure of sexual violence, athletic program stakeholders need to understand these dynamics.

Thus, in this study, we investigated the role of affect, power, trust, well-being, and post-traumatic growth in sexual violence disclosures by athletes and compared them to disclosures in another context by gathering first-person narratives. First, we examined the language of athletes involved in the lawsuit against Larry Nassar. Our hypotheses and research questions attempted to understand whether athletes disclose more trust and power themes in their narratives in relation to a comparison data set. Coincident with the high-profile trial (January 2017 to May 2018), the national conversation regarding sexual violence spiked (October 2017), epitomized by the #MeToo movement on Twitter. Despite the limitations of this approach (further described in the Discussion), we analyzed a sample of these disclosures as our non-sports context comparison group. We chose this comparison group primarily because of availability, sample size, and disclosure subject. The public availability of personal accounts of sexual violence related to the Nassar trial and #MeToo movement presented a unique opportunity to examine our research questions. We expected negative affect to be high in both corpora and did not make any directional hypotheses regarding emotion as a function of context. However, we hypothesized affective reactions to sexual violence in the sports context would evoke power, trust, well-being and post-traumatic growth language to a greater degree than the #MeToo Tweets. To test these hypotheses, we utilized NLP and network analysis. We also expected these subjective experiences to provide insight into practical and pragmatic intervention strategies. Below, we articulate some context for the data collection and provide a brief background on NLP and network analysis prior to elucidating the method and the results.

### **Larry Nassar**

In 2016, *The Indianapolis Star* brought allegations of sexual assault against Nassar to light and subsequently (at the time of this writing) at least 300 women have accused him of



sexual abuse. A formal lawsuit was filed against Nassar in 2017 by a portion of these women. That same year, Nassar plead guilty to seven counts of first-degree criminal sexual misconduct in Ingham County (MI) Circuit Court. Nassar received a 40 to 175 year prison term as part of sentencing and 168 women provided victim impact statements (VIS) detailing his abuse and its impact on their lives. These statements were recorded and, for those who gave consent, were made available. We used a sample of these victim impact statements as our primary data source.

## **#MeToo**

In October 2017, the #MeToo movement, a social media phenomenon where users described their personal experiences with sexual violence, went viral. The phrase #MeToo originated on MySpace over a decade earlier by Tarana Burke to promote empowerment for women of color who had experienced sexual violence. In the intervening years, social media sites like Twitter have allowed thousands of individuals to converse, forming an extremely large and supportive online community. As a brief aside, the symbol ‘#’ is used to tag a post/tweet with whatever follows the symbol. In this way, one can interact with others via a similar topic by posting short (140 character) narratives. In general, a Tweet tagged with #MeToo describes an experience or outcome of sexual violence but is usually not directed at a particular individual. Twitter data has been used to understand other important phenomena including sentiment (Pak & Paroubek, 2010), disease (Rodriguez-Morales, Castañeda-Hernández, & McGregor, 2015), and mortality (Eichstaedt et al., 2015). In this way, Twitter-based research often analyzes tweet content in relation to specific search terms, an approach we also employed.

## **Natural Language Processing**

To analyze the language in the VIS and #MeToo tweets, we leveraged NLP, which utilizes vector representations of words in machine learning algorithms to find topical themes

(i.e., power, trust) or general psychological states (i.e., affect, well-being, post-traumatic growth) in text. The widely used Linguistic Inquiry and Word Count (LIWC, Pennebaker, Booth, Boyd, & Francis, 2015) has often been employed to detect psychologically meaningful language across diverse phenomena including attention, emotion, social relationships, and individual differences (see Tausczik & Pennebaker, 2010 for review). Although LIWC has been prevalent we chose not to use it here as one of our primary goals was to ensure that negation was accounted for and that our language processing utilized a domain-independent machine learning algorithm rather than a frequency-based approach.<sup>1</sup> The recently developed SEntiment ANalysis and Cognition engine by Crossley and colleagues (2017) addresses these criticisms by including negation and employing more comprehensive dictionaries. SEANCE also empirically outperforms LIWC on both micro- and macro-indices (Crossley et al., 2017). Further, SEANCE employs domain-independent dictionaries that perform well in areas in which they were not trained and in small corpora (i.e., tweets; Andreevskaia & Bergler, 2008). Dictionaries included: General Inquirer (Stone, Dunphy, Smith, Ogilvie, & Associates, 1966), Lasswell (Lasswell & Namenwirth, 1969), Geneva affect label coder (e.g., Scherer, 2005), and EmoLex (Mohammad & Turney, 2013). These original sources provide full word lists for each dictionary.

## Network Analysis

To analyze the relationships between NLP-identified themes, we utilized network analysis (see Borgatti, Mehra, Brass, and Labianca's 2009 paper in *Science* for review).<sup>2</sup> While

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<sup>1</sup> LIWC automatically compares a corpus of text to words belonging to specific categories via a licensed computer program in a domain independent fashion. The LIWC dictionaries were not validated via a machine learning approach, however they were validated by researchers as related to psychosocial constructs. This “bag-of-words” approach has also been criticized for two additional reasons (Crossley et al., 2017). First, many indicators are extremely short (as few as 8 words in some cases) and second valence is not accounted for (i.e., LIWC would count “happy” and “not happy” equally, perhaps as an indicator of positive affect.)

<sup>2</sup> Network analysis employs an adjacency matrix in which nodes are placed in both rows and columns and if a relation exists (a tie) between them, a value is placed in the intersecting cell. Matrix algebra is employed to determine various measures that characterize the topology of the network and the relative influence of nodes on

traditionally employed to study social relationships, network analysis is useful for exploring the structure of relational data more generally (e.g., brain structure and functional connectivity, Sporns, 2011; autism and anxiety symptomology, Montazeri, de Bildt, Dekker, & Anderson, 2018). We employed this approach to determine the relationships amongst text-derived themes.

## Method

### Data Collection and Reduction

**Disclosures in a Sports Context.** The Nassar trial proceedings were video recorded, minimally edited, and posted online. As court proceedings were unsealed, these statements were considered public record. Nearly immediately, raw footage of victim impact statements were posted on YouTube in a series of 17 videos by Law & Crime Network, a credible source for law related content with nearly 20 million views. Prior to each statement, the prosecution articulated whether the individual had given consent to be publicly identified and if so, the statement was recorded. If not, the recording was stopped and restarted after the non-identifiable victim concluded. A total of 168 individuals provided statements. Most of these statements followed a similar format in which the individual described one or more experiences of sexual violence by the defendant, discussed the impact of this experience, conferred culpability, and provided thoughts on restitution. For this reason, these statements provide extremely unique naturalistic insight into the antecedents, consequences, and accountability for sexual violence in sports. We excluded statements from individuals who were not victims (e.g., parents of victims) and did not have access to those who did not give consent. Our final sample included 111 statements

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overall network behavior. For example, one might be interested in who is the most popular individual in an organization. To get at this question we might consider who is friends with whom in the organization. For each pair of friends, we would place a 1 where they intersect (a tie) in the matrix (row, column). Then we can calculate the number of times a person is nominated as a friend (i.e., indegree) as our measure of popularity. Subsequently there are a range of mathematical techniques to characterize node, dyadic, and network level variables (see Borgatti, Everett, & Johnson, 2018 for comprehensive review of analytic techniques).

resulting in a corpus of 147,928 words. Statements were transcribed in line with YouTube's licensing agreements with filler words removed and included only the victims' language. Transcripts were reviewed for accuracy prior to analysis by comparing audio to the transcripts.

**Disclosures in a Non-Sports Context.** Tweets that included #MeToo were downloaded on November 11, 2017 utilizing the R package *twitteR* (Gentry, 2016). Due to data constraints imposed by Twitter, downloaded tweets were created between November 1, 2017 and November 11, 2017. The resultant data set included 45,848 ( $N = 45,848$ ) tweets from 29,124 unique accounts. To improve usability, we employed several data cleaning techniques including removing tweets shorter than ten words and non-text. The final data set included 22,968 tweets for use in all analyses (total words = 384,825). Clearly, these data are not a perfect comparison. However, tweets tagged with #MeToo are typically disclosures of a sexual violence experience, or very directly related. We argue this comparison is an adequate first step for determining differences between sports and non-sports contexts due to the large sample size and nature of the tweet content. Later, we discuss ways to improve on this approach.

### **Natural Language Processing**

**Data Processing and Sentiment Analysis.** SEANCE (Crossley et al., 2017) was used to analyze all language data. We separated each VIS and each tweet into separate text files and individually passed these files through SEANCE. We included the option for negation and all utilized indices employed this feature. This process produced a normalized, quantitative score for each indicator, for each text file (i.e., a single tweet or VIS). Larger values reflected greater presence of an indicator and output was compared across corpora. With respect to the data reported here, the numbers are extremely small and raw values are uninterpretable in isolation, but are comparable relative to each other and across corpora.

## Network Analysis

We employed network analysis to examine the underlying relationships between affect, trust, power, well-being, and post-traumatic growth (VIS only). We computed bivariate correlations between each of the language indices and retained significant ( $p < .05$ ) positive correlations in a single matrix (c.f. Montazeri et al., 2018). These data formed a weighted adjacency matrix in which a weighted tie (equal to the correlation coefficient) was present between two significantly correlated indicators. This data structure was imported into UCINET (Borgatti, Everett, & Freeman, 2002) for analysis and NetDraw (Borgatti, 2002) for visualization. For a more detailed description of this type of network analysis, good examples can be found in Montazeri et al. (2018) and Sporns (2011). To identify the factors that were most important to the overall language structure (i.e. content), we calculated a node-level influence metric (betweenness) for each language indicator. Betweenness is defined as the number of times a node falls on the shortest path to all other nodes (geodesics), and is considered to be a measure of information control or influence over system behavior (Freeman, 1978).

## Results

### Power and Trust

To test the hypothesis that sexual violence disclosures in a sports context would contain language indicating greater power and trust themes we calculated Welch's  $t$ -tests (to account for non-equal variance and sample size) for 4 indicators of power (Lasswell dictionary) and trust (EmoLex dictionary). Results indicated disclosures of sexual violence in a sports context were significantly higher across indicators (See Figure 1).

[INSERT FIGURE 1 HERE]

### Negative Affect

We made no directional hypotheses regarding the impact of sports context on specific emotional content of sexual violence disclosures. Instead, we simply compared VIS to #MeToo tweets to determine differences in negative affect. We calculated Welch's independent sample *t*-tests for the 12 negative emotions in the GALC dictionary. Results indicated disclosures of sexual violence in a sports context were significantly lower in disappointment and significantly higher in anxiety, desperation, disgust, fear, guilt, shame, and stress. We expected a null result in overall negative affect, and results supported this hypothesis. Figure 2 summarizes results.

[INSERT FIGURE 2 HERE]

### **Well-being, and Posttraumatic Growth**

To test the hypothesis that sexual violence disclosures in a sports context would contain language greater in well-being and post-traumatic growth, we followed the same procedure as with power, trust, and emotion. We calculated Welch's *t*-tests for six indicators of well-being (Lasswell dictionary). Results indicated sexual violence disclosures in a sports context contained language significantly higher in well-being across all indicators. We operationalized post-traumatic growth via enlightenment (Lasswell dictionary) and positive outlook (General Inquirer dictionary). Results of the Welch's *t*-tests indicated significant differences such that disclosures in a sports context contained more post-traumatic growth and well-being language (see Figure 3).

[INSERT FIGURE 3 HERE]

### **Network Analysis of Language Themes**

To determine the most relevant components of sexual violence disclosures in an athletic context we conducted a network analysis utilizing relationships between (positive correlations) indicators to define ties for the VIS data set only<sup>3</sup>. Overall, well-being and trust emerged as the

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<sup>3</sup> Note that we also calculated this network for the #MeToo data, however none of the effects were  $> 0.1$  and included many spurious correlations due to the overpowered sample. Intercorrelations were different than the sports

best themes to characterize the overall structure of these disclosures, indicating these as the primary drivers of language use. Represented below (Figure 4), size is scaled to betweenness such that larger nodes indicate greater influence on the overall behavior of the disclosure system. Shading was used to represent similar variable types. The spring-embedding layout and removal of isolates (i.e., nodes with no ties) facilitated visualization and does not indicate topology.

[INSERT FIGURE 4 HERE]

## Discussion

We utilized novel data collection and analysis techniques to examine disclosures of sexual violence from victims of Larry Nassar and compared them to a corpus of text from disclosures of sexual violence in a non-sports context (#MeToo tweets). Using NLP, we quantified aspects of these disclosures (emotion, power, trust, well-being, and post-traumatic growth) to determine how a sports context constrains descriptions of experiences of sexual violence. We also examined the structure of relationships between these language indicators to determine the most relevant features that characterize sexual violence disclosures in sports.

### Power and Trust

We hypothesized that sexual violence disclosures in a sports context would contain significantly more power-related themes than #MeToo tweets. Results supported this hypothesis: athletes' disclosures contained more language related to gaining and losing power, authoritative power, and power doctrine. Power refers to the ability or capacity to direct others' behavior in the face of resistance. Combined with power doctrine (language related to power relations) our results indicate athletes are likely to experience an inability to overcome powerful others due to formal structures and the status that these positions engender (e.g., role-based power;

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context, however because our primary goal was to characterize the most influential aspects of a sports context we do not report these results here.

Brackenridge, 1997), resulting in negative outcomes such as sexual violence. Clearly, a highly regarded and trusted sports doctor that has treated Olympic athletes fits this description. This is especially troubling because of the position the doctor plays in preventing sexual violence as a mandatory reporter (Marks et al., 2012) and implies policy should be enacted that mitigates this risk. As expected, we also found VIS reflected more trust related language compared to #MeToo disclosures. With the caveat that this comparison is flawed, and in combination with the power results outlined above, findings support theoretical arguments that athletic contexts may exacerbate vulnerability to sexual violence due to structural properties inherent to the sports system (Brackenridge et al., 2008; Cense & Brackenridge, 2001; Nielsen, 2001). Moreover, if a powerful and trusted individual is an abuser, this violence is likely to extend over long periods of time due to the loss of power associated with victimization and the gain in power associated with the abuser. Given the relevance of power and trust in athletic settings, these values can be utilized to form the basis of new policies and procedures (Smith & Freyd, 2014) such as the Protecting Young Victims from Sexual Abuse and Safe Sport Authorization Act (2017).

### **Negative Affect**

We found disclosures from both samples were equivalent in overall levels of negative affect. However, VIS demonstrated higher levels of specific negative emotions such as anxiety, desperation, disgust, fear, guilt, shame, and stress, which have important clinical implications. For example, high levels of desperation have been linked to suicidal ideation and depression (Garlow et al., 2008), which may be exacerbated by increased anxiety (Hendin, Maltsberger, Haas, Szanto, & Rabinowicz, 2004). Moreover, disgust (especially self-directed disgust) is often seen in individuals who display non-suicidal self-injury (Klonsky & Muehlenkamp, 2007),



which can precede suicidal behavior in young adults (Whitlock et al., 2013). Thus, it is important to assess and treat these specific affective responses.

### **Well-Being and Posttraumatic Growth**

Our results also point to the reality that athletes are resilient (Wilson, 2010). In fact, according to the sports protection hypothesis (Fasting et al., 2003) sports participation may temper the negative effects associated with experiencing sexual violence (Simon et al., 2015). As hypothesized, we found athletes' disclosures included greater levels of language related to enlightenment and positive outlook. These results support the idea that clinical interventions that incorporate finding meaning may help individuals coping with negative emotions and trauma resulting from victimization (Lee, Scragg, & Turner, 2001). While sports participation may provide some resistance against the negative outcomes of sexual abuse, it is difficult to extricate whether these indicators are the result of participation in sport, or other factors (see McGinley, Rospenda, Liu, & Richman, 2016; Vertommen, Kampen, Schipper-van Veldhoven, Uzieblo, & Van Den Eede, 2018 for arguments that sports participation is a risk factor). The athletic experience may afford athletes who have experienced sexual abuse the ability to contextualize the experience and grow from it. In other words, sports participation may predispose individuals who are abused to increased post-traumatic growth or reduce the negative impact on well-being. However, it should be noted that we do not suggest sports participation alleviates the negative outcomes of sexual violence or that all athletes will experience these potential resilience effects.

### **Network Themes**

We examined how indicators of negative affect, power, trust, well-being, and growth were related in the athletic context by analyzing the strength of association of these themes using network analysis (cf. Montazeri et al., 2018). The corpus of athletes' narratives showed

important relationships between themes related to trust and well-being in the context of abuse by a powerful and trusted other. Trust may refer to the relationship between the athlete and abuser, an identified risk factor. Well-being likely refers to positive outcomes experienced by victims of the abuse, potentially reflecting post-traumatic growth or meaning making. These patterns are likely due to the VIS format in which athletes spent considerable time discussing violations of trust by a powerful other (i.e., Nassar) and its impact on their well-being explicitly. An empirical question is whether these themes would be similar in other victim impact statements outside of a sports context, an investigation currently underway. With this caveat, the primary take away from the network analysis is that when confronting a perpetrator of sexual violence in a sports context trust and well-being emerged as the most relevant motivations.

### **Implications**

Our results have important implications for the development of new policies and procedures for early detection and prevention of sexual violence in sports. Themes of trust and power were evident in athletes' narratives regarding their experiences of and reactions to sexual violence. Thus, educational interventions that define clear examples of power inequities and strategies and skills related to negotiating power differentials in the athletic context could be extremely beneficial (Paine & Hansen, 2002). In line with this recommendation, these types of educational policies and programming should also address misconceptions regarding abuse including the assumed presence of physical evidence and the dangerous stranger as the most likely perpetrator (Babatsikos, 2010). Further, to maximize impact and diffuse the male-dominated sports culture (Taylor & Hardin, 2017), educational interventions should exist across the organizational structure, targeting both individual and organizational levels (Bronfenbrenner & Morris, 1998). For example, individuals who are in positions of authority to protect and

nurture the health and well-being of athletes may require specific skill training to overcome the barriers they face in performing this duty. Moreover, it may not be enough to simply know about sexual violence-related policies and procedures, but individuals must also be trained to enact them. Although the existing literature on sexual abuse in sports has primarily focused on coaches as abusers, as they are often the most likely perpetrators (Fasting & Brackenridge, 2009; Fasting et al., 2008), they are not the only perpetrators of sexual violence against athletes. Minimal research (Marks et al., 2012) has examined the role of the team doctor in preventing sexual violence in athletics, and we are not aware of any studies that have specifically examined this relationship in the context of doctor as abuser. This gap is a considerable one as athletic organizations have relied on this structural role to be the primary prevention strategy and first intervention point against abuse. Additionally, the power dynamics and trust dynamics that accompany this role virtually ensure that if a doctor is the source of abuse it will go unchecked, perhaps for decades as was the case in the data examined here. As such, our strongest recommendation is that individuals who are trained, capable, and invested in the welfare of athletes (i.e., sports psychologists) assume this role to ensure the safety and well-being of women in sports. Fortunately, a recently passed law (Protecting Young Victims from Sexual Abuse and Safe Sport Authorization Act of 2017) has initiated this process and thus, efforts can be made to ensure and facilitate compliance.

### **Limitations**

Our analytical approach, although novel in the context of understanding athletes' reactions to sexual violence, had several limitations. For example, our comparison sample consisted of disclosures about sexual violence from #MeToo posts that in many ways were not comparable to VIS by athletes in the Nassar trial. For example, character limits on Twitter

prohibited individuals from providing a full account of their experiences and, given the point of the #MeToo movement was to focus on experiences of assault, tweets that included growth themes were likely constrained. We also do not know whether some of these tweets referenced a sports context. Additionally, unlike our trial sample, the #MeToo tweets likely included disclosures from men, which introduces other constraints on disclosure not linked to sports participation. Moreover, verbally disclosing in the presence of one's abuser in a formal setting is considerably different than on Twitter. Future research should use a more comparable sample of women, such as other VIS in cases of sexual violence outside of sports to replicate these results. A second limitation was the NLP approach we employed. While SEANCE is a more sophisticated approach to textual analysis than bag-of-word approaches (e.g., LIWC), other techniques such as topic modeling, latent semantic analysis, latent Dirichlet analysis, or other supervised machine learning approaches may provide more nuanced insight. Lastly, our research did not differentiate between different aspects of a disclosure (e.g., the actual violence experienced, the outcomes, direct addressing of abuser) which, if undertaken, could begin to parse out different aspects of how a sports context constrains the personal narrative one constructs as a survivor of sexual violence.

### Conclusion

One survivor of Nassar's abuse repeatedly asked the court "How much is a little girl worth?" Our research analyzed these and other statements by female athletes who disclosed their experiences and reactions to sexual abuse. Compared to disclosures made on Twitter through the #MeToo movement, we found the disclosures of athletes victimized by Larry Nassar demonstrated clear evidence of power and trust themes—psychological realities that have been shown to increase athletes' risk of abuse. We suggest that power and trust are important aspects

451 of athletic culture and robust systems of support and advocacy that leverage power and trust  
452 values could be useful in reducing sexual violence risk, as well as, for fostering well-being and  
453 resilience.

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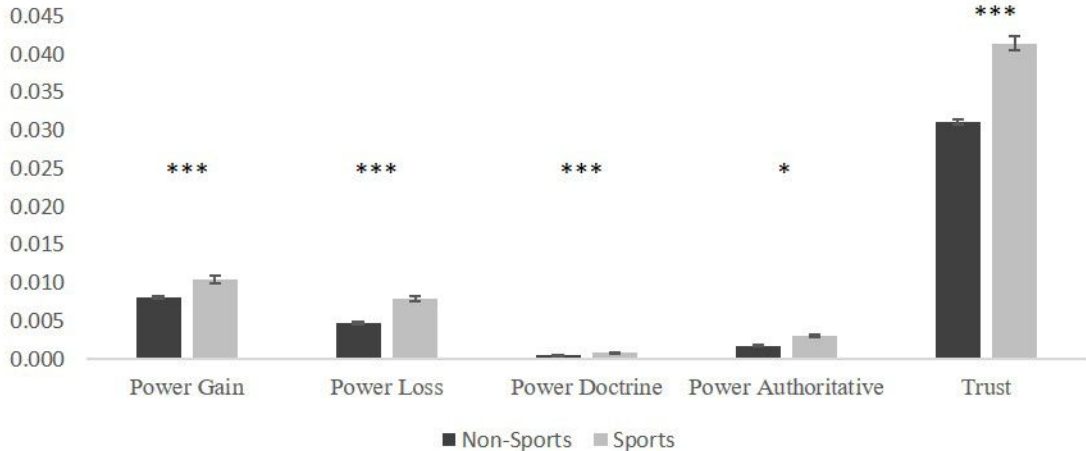
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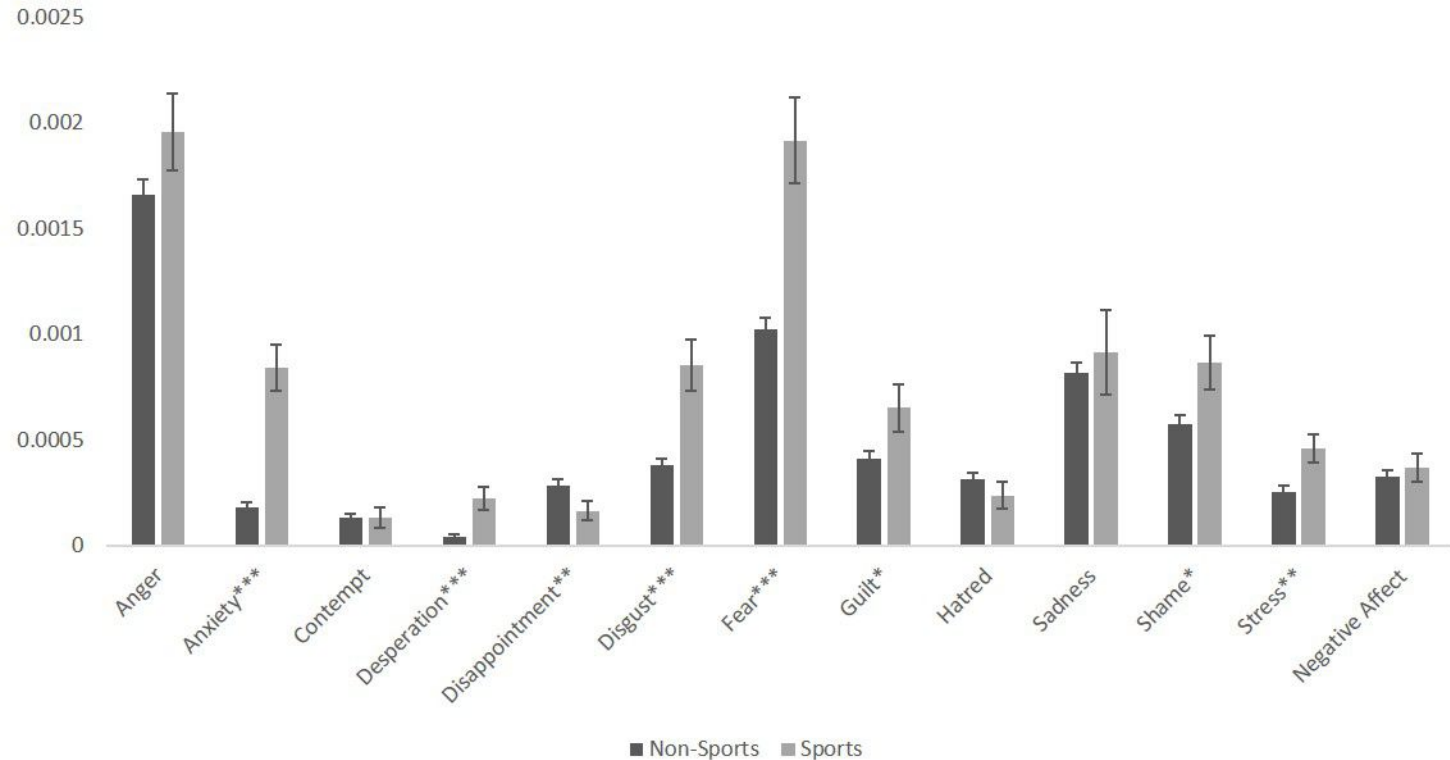
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## Power and Trust



## Emotion



## Positive Outcomes

